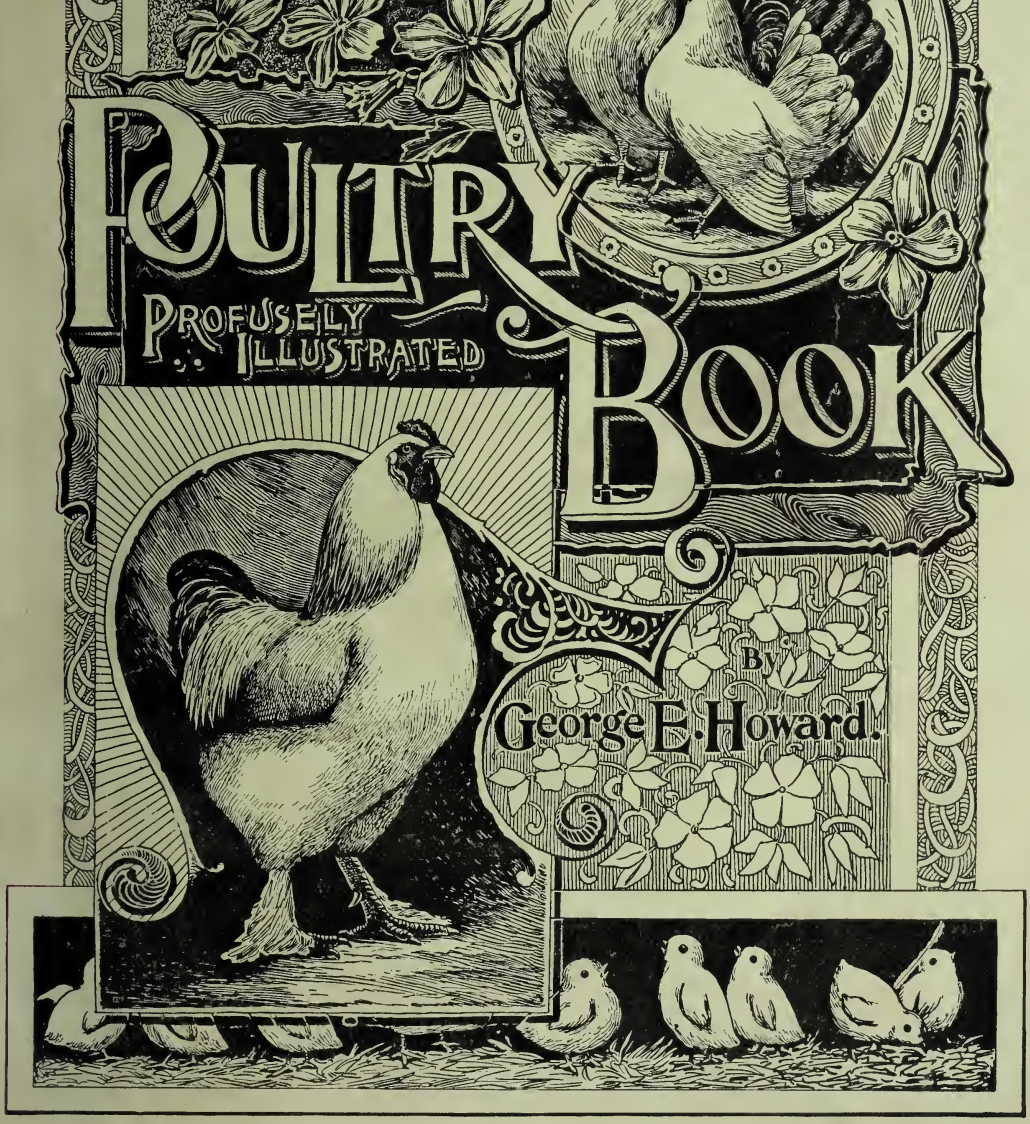
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The American Fancier's Poultry Book

Profusely Illustrated



By George E. Howard.

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The American Fancier's

POULTRY BOOK.

BY

GEORGE E. HOWARD.

WITH ILLUSTRATIONS

BY THE AUTHOR.



WASHINGTON, D. C.:
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1898.

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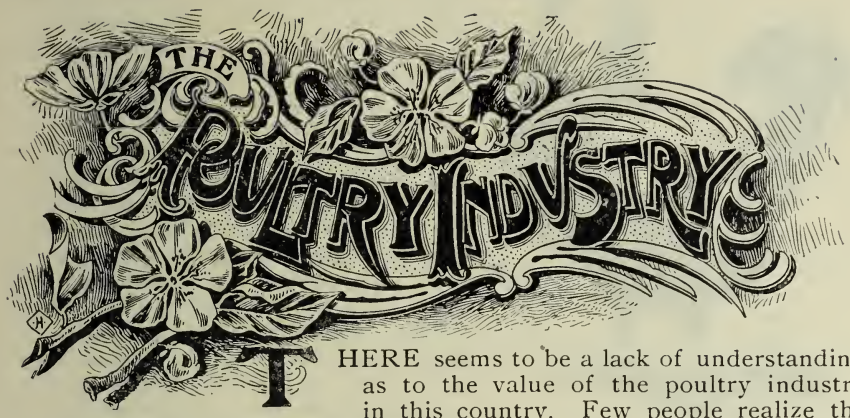
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WHITE COCHIN COCK.

"Feathered from the ground up."



THERE seems to be a lack of understanding as to the value of the poultry industry in this country. Few people realize the immensity of the egg-trade as compared with other branches of farming. Claims have repeatedly been made that the demand for eggs has exceeded the supply many times. Yet there appears to be a hesitancy on the part of a great many to enlist their energies in this business, even with these facts staring them in the face.

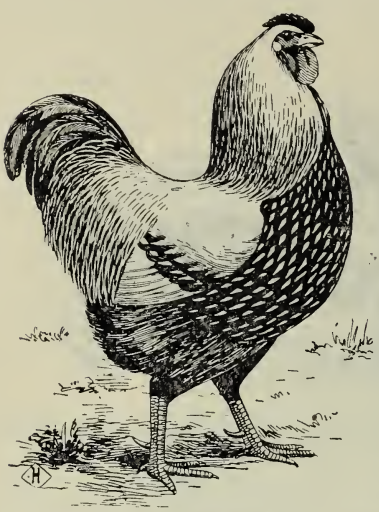
Statistics have shown that over $3,000,000 are spent annually in the importation of eggs from foreign countries. This should be an incentive to encouragement of home products. There are countless acres of barren land in the United States that would prove excellent for poultry farms. This land is lying idle and the owners are losing year by year through their non-appreciation of this fact, while foreigners are reaping the benefit.

Belgium, a country about the size of the State of Maryland, with a population four times as great, produces annually 274,967,834 eggs; about forty-eight eggs for every man, woman and child. This enormous production is secured under adverse circumstances, and in a country where every effort is made to cause the land to produce food for home consumption.

This result is suggestive of the grand achievements that may be compassed in a land like ours, where grain enough is wasted annually to feed the population of Belgium.

France, with an area of 204,147 square miles, of which only 98,460 are capable of cultivation, realizes more than 2,000,000,000 francs annually from her poultry interests. The present population of France is 38,905,788 and if an equal distribution of the land that is capable of cultivation were made there would be two acres to each person.

Notwithstanding the disadvantages of climate and high cost of food for the fowls, France furnishes England annually over 800,000,000 eggs. The consumption of eggs in France is reckoned at about 2,000,000,000 annually, which, added to the large exportation, places the annual production in this little Republic at about 2,800,000,000. The value of the exportation is $13,000,000 annually, and the value of the eggs consumed at home is estimated at $35,000,000. To this must be added the amount received for poultry exported and of that consumed at home, $75,000 000,



SILVER-LACED WYANDOTTE COCK.

and $45,000,000 for stock value carried over every year. The climatic conditions are inferior in many respects to those of this country; besides, the available space is much less, which necessitates extra care in attention and feeding of stock. The French poultry farmer realizes a net profit of from 15 to 85 per cent.

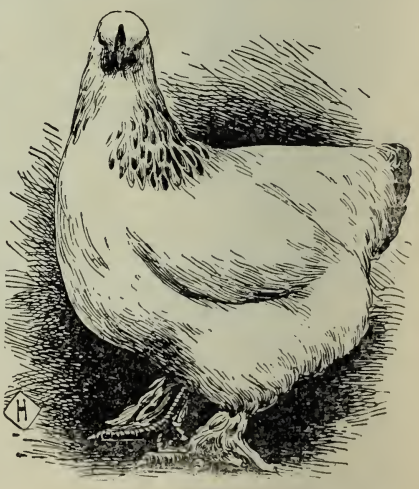
Careful inquiry reveals the astounding fact that the United States, instead of producing more eggs than are required for home consumption, imports annually over $3,000,000 worth of eggs. In 1872 the importation was 6,000,000 dozen eggs, which, at twenty-four cents a dozen, amounted to $1,444,000. New York State and city consume about $45,000,000 worth of poultry and eggs annually, and the population of both State and city is about 5,820,871.

Therefore, the United States, with her 63,000,000 population, must consume $495,000,000 worth of eggs each year, and in order to determine the value of the poultry industry we must add to this $63,000,000, for the value of the fowls retained for breeding purposes and laying stock, and $600,000 for blooded stock and eggs.

This reveals the sum total of this industry here at that time to have been $559,600,000 annually, or as full statistics would show, more than $600,000,000.

For the year 1882, the following figures show the cash value of the products of the United States: Cotton, $410,000,000; hay, $436,000,000; dairy products, $254,000,000; poultry and egg products, $560,000,000. Notwithstanding this, the last is the only product that we do not export. Our entire yield, which is vastly insufficient to meet the demand, is all consumed at home; besides, statistics show that in 1882 we imported from foreign countries 13,000,000 dozen eggs, as against 6,000,000 in 1872.

While the Eleventh Census shows a creditable increase in the poultry industry in this country, still it is not yet all that could be desired. The number of chickens for the year 1889 was 258,472,155; the number of other fowls was 26.816,545, and the number of eggs produced was 817,211,146. Estimating eggs to be worth only twelve cents a dozen, this would amount in round numbers to $100,000,000. The States, in order named, lead in the production of chickens: Missouri, Illinois, Iowa, Kansas, Ohio,



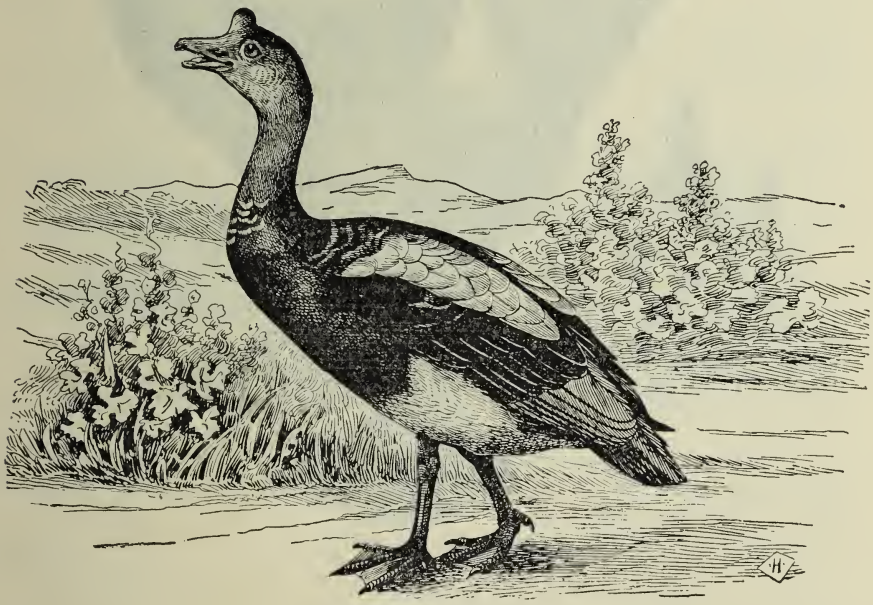
LIGHT BRAHMA HEN.

Kentucky and Indiana. Ohio is the banner State in egg production, with Iowa following. Ohio and Missouri lead in eggs and poultry.

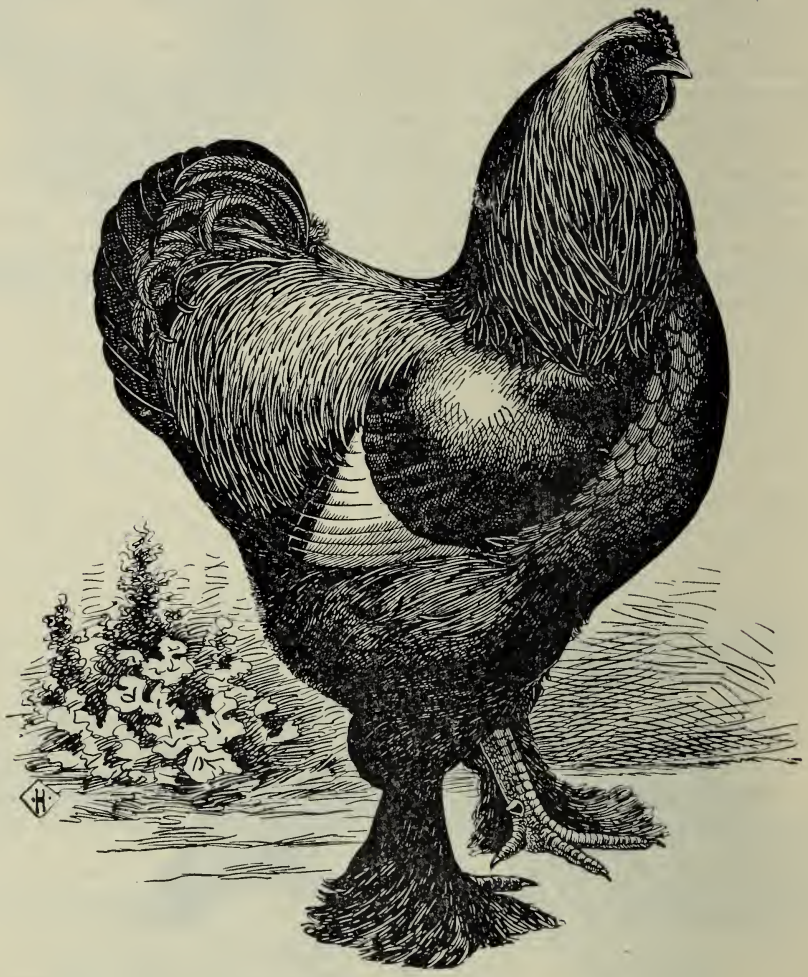
While these figures afford dry reading, they are gems to us in the knowledge of the poultry industry. From them we can draw our conclusions as to the value of the industry in the United States. They startle us to a realization of the wealth which is at our disposal if we would cultivate this vast field.

Here, where we have so many natural advantages as compared with other countries, our products should far exceed in proportionate value. These facts also show that the value of poultry exceeds even wheat, the greatest agricultural product of our land, by over $72,000,000.

Poultry and eggs are favorite food, and unlike other products, which are grown only in sections, impart their flavor and force to castle and cottage alike, and are cultivated to some degree wherever man dwells in a civilized state. The importance to the commercial world of the industry in question cannot be estimated prospectively. When we consider that it is only in its infancy, greater should the exertion be to increase it and reap rich rewards for ourselves.



SPUR-WINGED GOOSE.



DARK BRAHMA COCK.

General Management

THE desire is natural to produce the best results possible in any vocation. Imprudence dwarfs the enterprise, and shadows one's hopes for success. False judgment as to the proper management undermines the industry. The business of poultry raising is not one learned in a day. All men who enter it are not born poultrymen, neither can they grasp the opportunities presented when occasion demands. Yet, by close study of the conditions necessary to success, and a strict observance of the duties attached, poultry raising may be made profitable, whether on a large or small scale.

If a small stock be kept, every effort should be made to have it yield as much in proportion as if the business were a large one conducted for a livelihood. This will establish a system that is essential to the development of the industry.

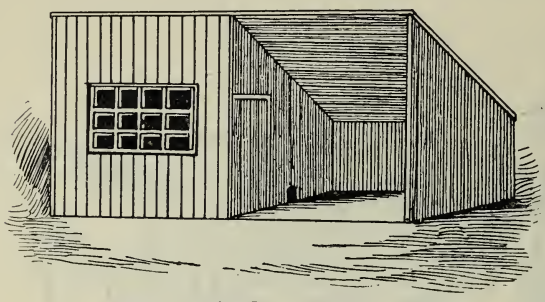
Personal attention is to be desired above all things in the management of your flock, and the pleasure derived therefrom will be added to by the realization of having advanced financially and intellectually through your own work and study—one of the most fascinating pursuits in which one can engage.

Building The House.

The first consideration is a suitable location for the poultry house. So far as possible this should be built on an elevation having a natural drainage. The best soil for a poultry yard is sandy or gravelly, as such ground can be kept in better sanitary condition by natural absorption and facilitates easy cleaning. Clayey soil will be found damp on account of mud and pools that are sure to result from rain.

In the construction of the house there should be no lavish display or ornamentation. It should be erected for comfort and convenience. The size is governed by the number of fowls to be kept, and the arrangements of the interior by the fancy of the builder, consistent with good handling.

An excellent plan for a house holding 25 fowls is given in illustration. The ground plan is ten by twelve, with an open shed attached, facing south. The front elevation is nine feet and the rear six. The roof is a plain shed roof covered with tar paper and stripped on the edges. A window and a door are in the south front and a smaller window is in the east side. The whole house is built of one-inch boards, and the cracks are covered with strips to keep out the dampness and drafts.



PLAN OF HOUSE WITH OPEN SHED.

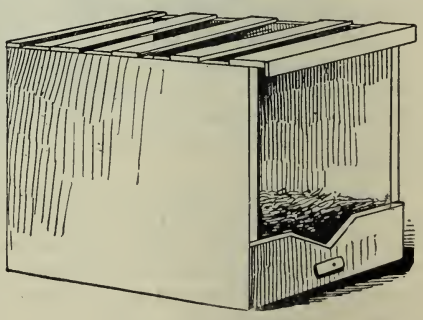
The floor is raised six inches from the ground and is covered with four inches of road-dust to facilitate cleaning, and give ease to the fowls' feet. It also affords a place in which they may dust themselves. The floor of the shed is also raised from the ground to the same level as that of the house; this is covered with four or five inches of straw for the hens to scratch in for the grain food. This shed gives shelter to the fowls in bad weather and at the same time they may enjoy the fresh air.

The interior of the house is arranged with inclining roosts and movable nests, so that cleaning may be without trouble. Nothing should be made stationary, as vermin gather in cracks and crevices. The nests, as shown in cut, should be large and light, and so built as to be easily handled. There is no bottom to them, and the lattice door is convenient when setting a hen to prevent others from laying in the same nest. This door should be moved once a day for the setting hen to feed.

A liberal use of whitewash on the exterior and interior should be made twice a year. The droppings should be cleared away each day. No ventilator should be used during the winter, and in summer the windows may be kept open. If the house be kept clean there is no need for ventilation, other than is found in the house. The less drafts there are in the poultry house the better it is for the fowls.

Selecting a Breed. Having the house and yard in readiness for your flock, the next thing to do is to select your breed, taking into consideration all the conditions which affect the raising of poultry in your location. The difficulties of poultry raising may be overcome in a measure by the judicious selection of breeds. If you have but a limited area and your flock must be confined most of the time, you should choose those breeds which may be kept in confinement with best results.

The suburban residents produce a large proportion of the poultry and eggs consumed in this country. The farmer as a rule keeps one flock on a farm with less satisfaction than he who takes care of one in confinement. The best egg records are from those flocks which have been kept in yards instead of having an altogether free range. More labor is required, of course, to manage flocks in confinement, yet this is made up for in the increased egg-yield and saving in the cost of the range.



PLAN OF NEST.

The Leghorns, Hamburgs, Minorcas, Polish and Houdans are true rangers, and an extra degree of care

is needed to provide them with litter for scratching to satisy their restless natures where their range is a small one. The Plymouth Rocks and Wyandottes belong to the middle class, as it were, and will give great satisfaction either for confinement or on a free range. The Brahmas and Cochins are strictly fowls for confinement, and will naturally do better under that condition than any other class.

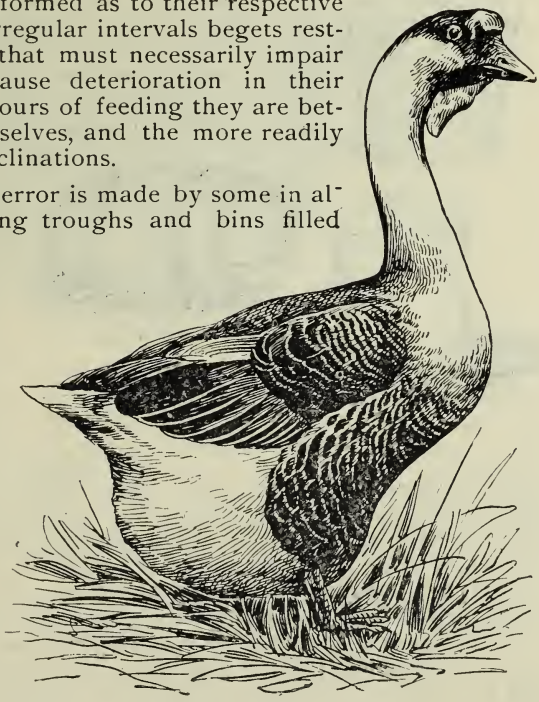
The great difference of opinion regarding the best breeds for special purposes causes much doubt to exist as to those to be chosen. The surroundings of the breeder necessitate a careful study of the various points of excellence of the fowls best suited to the purpose in view. Success in the poultry business depends much upon proper selection.

If eggs are to be made the principal source of income, one of the non-sitting breeds will be found the best. These are the first mentioned. The middle class may be looked to for fair laying qualities, are hardy and early maturing birds, and make a fine dish. In the latter class are the large birds that are intended for table purposes. They are easily kept on limited range and are rated as the best winter layers.

Regular Feeding. A perfectly regular system of feeding should be adhered to. Nothing perhaps is more beneficial to the condition of the fowl. After careful consideration adopt a system of feeding which best commends itself under the conditions. The fowls will become accustomed to the hours of their meals, and will look for them. This intelligence is natural to all mundane beings, and the more it is encouraged with dumb animals, the easier it will be to control them and keep yourself informed as to their respective conditions. Feeding at irregular intervals begets restlessness among the flocks that must necessarily impair their constitutions and cause deterioration in their value. Between regular hours of feeding they are better contented among themselves, and the more readily follow out their natural inclinations.

Over-Feeding. A great error is made by some in always keeping troughs and bins filled with feed. This practice is not only a waste, but an obstacle to egg-production. The hens are tempted to eat and as a consequence, not getting the necessary exercise by scratching, they become lazy and too fat.

No fixed rules, as we have said, can be made for the quantity of food that is necessary for the best results. Naturally, fat-forming foods can be given to a greater extent to fowls having a free range. An over-fed hen



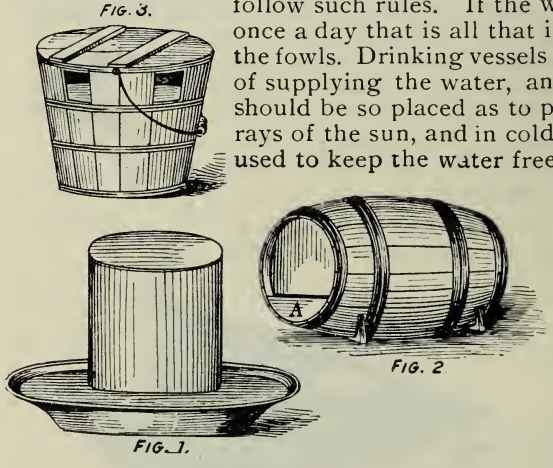
BROWN CHINA GOOSE.

becomes egg-bound, lays soft eggs, or ceases to lay except for very short periods ; besides, being induced to become broody more frequently than normal.

The estimate is made that a hen will eat five pecks of corn in a year, or forty quarts. How to divide this up or lessen the corn when other foods are given, is left to the breeder to determine, as everything depends on how much food other than corn he gives, which must be deducted from the corn. A laying hen should not be fat; her food must be rich in nitrogen and the phosphates.

Exercise. Too much emphasis cannot be given to this consideration. Make your hens scratch and work, if you do not want them overfat or to die on the roost from apoplexy. The best methods of giving exercise are by scattering the food, and by burying it in the litter on the floor. While egg-producing fowls may be fed from hand, as it were, exercise will be far more satisfactory in the end. Good digestion is an important factor in egg-producing, and exercise promotes digestion.

The Supply of Water. In every 100 parts of an egg 84 are water. An abundant supply of pure water at all times is conducive to the health of the fowls, and in no case should this be neglected. Many are of the opinion that fresh water is such a necessity that the fountains should be replenished two or three times a day. It may be well to put stress upon this, but it is hardly necessary to follow such rules. If the water is properly supplied once a day that is all that is needed to give drink for the fowls. Drinking vessels are used as a proper means of supplying the water, and in warm weather they should be so placed as to protect them from the hot rays of the sun, and in cold weather means should be used to keep the water free from ice, and, if possible, at a temperature of about sixty degrees. Sinks or stagnant pools are to be avoided. Pans and shallow dishes are unfit for drinking vessels, as the water becomes stale and dirty in a short time.



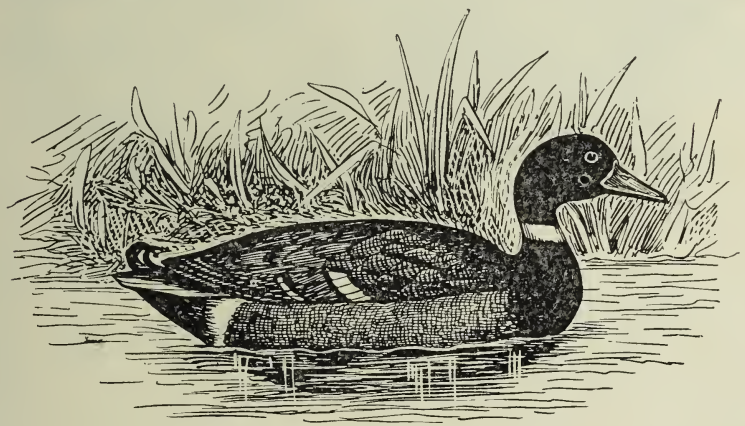
DRINKING VESSELS.

In the fountain drinking vessels only a small portion of the water is exposed, and fresh water replaces that which is used. The most common fountain in use is that shown in Fig. 1. This is easily made. Take an empty tomato can, or similar can, with one end open; puncture several small holes about one-half inch from the edge; fill with water, and place a dish or pan on it; then quickly invert it. The water will fill the dish to the height of the holes, and the same amount of water will be kept in the dish until the supply in the can is exhausted.

A larger fountain may be made from a water-tight keg, as shown in Fig. 2. In the head of the keg bore a hole about three-quarters of an inch in diameter and about two inches from the edge. To the outer edge of the keg attach zinc mouth piece A, as shown in the illustration. On

each side of the keg place two pegs to serve as legs and keep it from rolling to one side. The keg is filled by standing on end and pouring the water in at the hole at the mouth. A handy and convenient fountain can be made from an old bucket. Candy or fine-cut tobacco buckets answer the purpose very well. Cut two or three holes in the side, as shown in Fig. 3, down to the first hoop. Brace the lid with strips to keep them from warping, and attach to the lid a small hinge to keep it in place. This affair is cheap and any one can make it. The water is entirely free from dirt, and when kept in a cool, shady place, it will answer every purpose.

In winter when the weather is very cold, the fountains should be emptied at night to prevent freezing. The water used for filling them should be heated to about sixty degrees. Fowls generally drink when first coming from the roosts in the morning, and it is advisable to give them warm water, which acts as a tonic to their system. In cold damp weather place a few drops of iron in the water; it is well also to add a few drops of sulphuric acid to the iron. The proportion in this tonic should be a lump of the sulphate of iron about the size of a hazel nut, and about three drops of the sulphuric acid to the gallon of water. This tonic should also be used during the moulting period, to assist the fowls through this most trying period.



MALLARD DRAKE.

Oyster Shells and Grit.

The shell of an egg contains about fifty grains of the salts of lime, or about twenty grains of pure uncombined lime, besides the lime that is in the mineral matter of the white and yolk. A reference to the chapter on "Feeding for Eggs" will show the foods that are richest in lime as substance for the shell. The quality of the shell should be considered when feeding, by selecting those foods which are richest in lime. To produce the shell of one egg there is needed 100 grains of lime.

Repeated experiments have proven that oyster shells are not a necessity for shell material, but at the same time valuable as grit. The feeding of oyster shells during the laying period is to be recommended. One pound of crushed oyster shell contains lime enough for about seven dozen eggs. Fine gravel containing limestone will probably as well

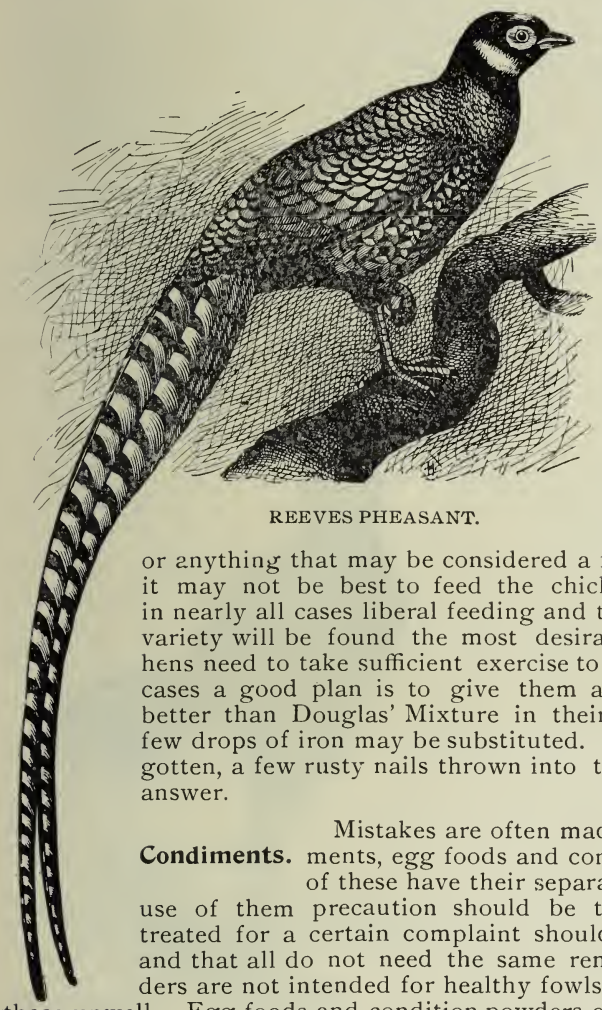


LIGHT BRAHMA HEN, "WONDER."

supply the deficiency of lime existing in most foods, but use of the sharper grits with it may be well.

Long or sharp splinters of glass or dry bone should be avoided in the grit furnished. The size of the particles of grit had better be larger than a kernel of wheat and smaller than a kernel of corn. An unlimited supply of well-pounded glass has been found to produce no bad results where the food and the grit accessible to the fowls contains an abundance of lime; but where the food is deficient in lime, and no other grit is obtainable, hens eat an injuriously large quantity of glass. There should always be an abundance of grit within easy reach of the fowls; a deficiency will retard the digestion and weaken the constitution.

Moulting. No season is more severe upon the fowls than the moulting time. The greatest of care must be taken to keep them in good condition. It is a drain on their vital powers to furnish the material for a full coat of new feathers. There is apt to be a laxity of attention to their feeding during this period on account of their cessation of laying, when in fact there should be more care taken. It is a good plan to select all the fowls that it is desired to winter or keep for breeding, and market the balance. This will cut down the expense of the moulting season. Hens which moult early, if they are in good condition and are comfortably housed, will nearly always make the best winter layers, while the later moulters will rarely lay until spring. These



REEVES PHEASANT.

latter should have a place where they can keep warm and dry, and be given an abundance of nutritious food.

The period of moulting may be shortened by careful attention, and a supply of food rich in muscle, bone and feather forming materials rather than fat-making foods. Always provide pure, fresh water and keep the quarters clean. Wheat, oats, linseed meal, bone meal, meat scraps, and fresh ground bone make better foods at this time than corn or anything that may be considered a fattening ration. While it may not be best to feed the chickens all they will eat, in nearly all cases liberal feeding and the supplying of a good variety will be found the most desirable thing to do. The hens need to take sufficient exercise to be healthy. In many cases a good plan is to give them a tonic, and nothing is better than Douglas' Mixture in their drinking water, or a few drops of iron may be substituted. If these are not easily gotten, a few rusty nails thrown into the drinking vessel will answer.

Condiments. Mistakes are often made in the use of condiments, egg foods and condition powders. Each of these have their separate use; so that in the use of them precaution should be taken that those fowls treated for a certain complaint should be conditioned alike and that all do not need the same remedy. Condition powders are not intended for healthy fowls, but as a medicine for those unwell. Egg foods and condition powders give good results where the flock is lacking in hardiness or health, but the best course is to give no medicines, unless absolutely needed, and they are not likely to be needed if proper care is taken with the birds. Yet, by judicious use when necessary they may be made to be of great service. On cold or wet days they often obviate ill effects; birds that need medicines or stimulants should be singled out and treated by themselves; you might as well give poison to all at once as to treat the whole flock indiscriminately because a few are affected. This reference to the use of what are the poultryman's best friends at times is only made to prevent their abuse as daily foods.

Of course, it is necessary that some kind of stimulant be used as seasoning at times. The prepared foods for poultry are insipid when compared to the pungent flavors of grasses, buds, seeds, and herbs,

which, with worms, make up the food of fowls in a wild state. In winter especially we must supply their wants entirely, so the addition of cayenne pepper, horse-radish, ginger, mustard, and a variety of spices to the morning meal is helpful to the birds in confinement, or those unable to find outdoor picking. By properly administering the seasoning the troubles of the winter season may be alleviated. We give below the recipes which have been used with good effect :

No. I. Liquorice, two ounces ; ginger, two ; cayenne pepper, one ; aniseseed, one-half ; pimento, two ; sulphate of iron, one. Powder and mix.

No. II. Cassia bark, one and one-half ounce ; ginger, five ; gentian, one-half; aniseseed, one-half· carbonate of iron,two and one-half. Powder and mix.

No. III. Peruvian bark, two ounces; citrate of iron, one ; gentian, one; pimento, two; cayenne pepper, one. Powder and mix.

No. IV. Cascarilla bark, two ounces; aniseseed,one-half ; pimento, one ; malt dust, two ; carbonate of iron, one. Powder and mix.

The first powder is chiefly used for a sudden cold. The second will be found excellent as a tonic in wet or cold weather, or for young turkeys. The last is somewhat like the first, and is preferable for more continued use when required for preparing fowls for exhibition. ·As a restorative after exhibition No. III is effective. The No. IV may be mixed with sugar at discretion, in the proportion of three parts sugar to one of the powder. This will assist in making weight and it is liked by the fowls, but too raw a quality must not be used or purging will surely result. In using these condiments enough should be added to the soft food to give a slight characteristic taste only ; except on special occasions, as a medicine rather than a tonic, give as much as will lay on a ten cent piece made into a small pill with butter and meal.

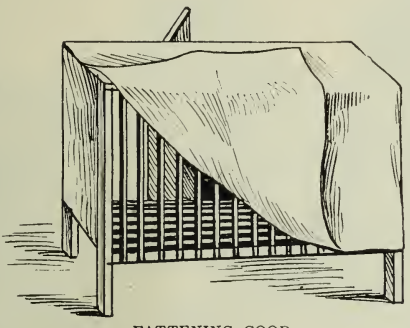


MALAY COCK.

One of the best tonics for fowls is Douglas' mixture, an old and well-tried recipe. It is : Sulphuric acid, one-half ounce ; copperas, six ; rain water, four. A tablespoonful to six quarts of water in the drinking vessel. If the birds have a cold or are out of sorts, its effects are marvelous.

Fattening Poultry.

Fowls that are intended for table or market may be fattened and increased in weight if desirable. Such poultry in the markets always find a ready sale and a fair price. Properly kept fowls are of course generally in good condition for the table at any age, but we may increase the amount of flesh and make it firmer, so that the birds will dress to better advantage. There are always culls in every flock, besides the surplus stock that must be disposed of.



FATTENING COOP.

It is suggested that the birds intended for the purposes mentioned be removed from the yards, and placed in a coop like that shown in the cut. This may be of any size desired, according to the number of fowls to be fattened. A good number to place in a coop is ten, or perhaps a dozen. Better results accrue when there is no over-crowding, and only fowls that have run together should be put together, otherwise their disagreements will prevent increase of weight. The coop must be so arranged as to be kept perfectly dry and free from drafts, and it should have a cover of canvas to draw down and keep the inmates in darkness. The coop should be closed on three sides and have a slatted front. It should be thoroughly cleaned before placing the chickens therein.

Several hours should elapse before food is given. The birds, naturally fretful at their confinement, refuse to eat heartily if allowed food at first; whereas, by fasting them at first they begin to eat as soon as food is thrown them. Be sure to feed only what they will eat up clean. Always keep a fresh supply of water before them. After feeding the covering should be drawn down and the birds left without light until an hour before next meal.

Punctuality in feeding will avert annoyance among the birds. Barley meal, oatmeal, buckwheat meal, mixed with milk, is an excellent food for fattening. Another good mash is wheat meal with potatoes, one part of each, into which, while hot, stir a pound of common lard, beef tallow or sweet chandler's scraps, to six or eight quarts of the mash. This should be fed warm Place a basin of grit or coarse gravel handy, to assist digestion, and occasionally mix a little powdered charcoal in the soft food to purify it, and guard against souring in the crop.

Under this treatment fowls will be ready for dressing in two or three weeks. The birds should be kept as still as possible in these compact coops while the process of fattening is going on ; no exercise whatever is to be given them. We will make no recognition of the French method of cramming, as we consider it unnatural and unprofitable.

Boiled grain food may be fed to fattening fowls with advantage. This is prepared by boiling the grain in water until soft enough to be easily bruised between the fingers. At this stage the grain has swollen so that the farina, splitting the membrane which surrounds it, gives it a bursted appearance. Fowls generally prefer cooked food to dry food, and they thrive and grow fat quicker upon it. Besides the decided gain in the bulk of food treated in this way, its nutritive value is also increased.

The following shows the comparisons of grain in bulk: Four pints of oats boiled will fill a pint measure seven times. Four pints of barley boiled will fill the same measure ten times. Four pints of wheat boiled will fill it ten times. Four pints of buckwheat boiled will fill it fifteen times. Four pints of rye boiled will fill it fifteen times.

A practical diet of cooked food for fattening will prove of benefit to the birds, and they will thrive better on a variety of food.



BROWN LEGHORN COCK.

In-Breeding. To the fancier who breeds for points, and the practical breeder who breeds for qualities, the laws governing breeding mean two different things. This subject is one over which there is much contention, and it needs to be thoroughly studied by actual observation to be understood. Many examples are known where the effect of the male on the progeny after the first copulation with the hen, extends through the larger part, if not the whole, of her life. This knowledge has been skillfully used by breeders in cases where it is desired to infuse into the breed some special qualities of another breed, such as hardiness of constitution, special markings of plumage, etc. A cross thus thrown in and bred out again may be quickly accomplished by this means. There is a tendency for characteristics of remote ancestors to reappear in their descendants, although but slightly manifested, if at all,

in near descendants. There is a tendency to return to the original types of structure and character.

Mating fowls that are near kin is strongly condemned by some practical breeders,but this remating of the offspring to the parent stock may be successfully accomplished to the improvement of the flock. The first approach to this method should not be so closely allied as brothers and sisters, but for the first season there need be no hesitancy in pairing a hen with her chicks. The harm of in-breeding is the constant repetition without any regard to selection; this is undoubtedly dangerous to the flock and certainly reduces the size of the birds and impairs their constitutions.



WHITE FACED BLACK SPANISH COCK.

When fresh blood is needed in a flock, the best plan is to purchase a vigorous cockerel from some reliable breeder of the same strain of fowls, and mate him with the females of your flocks. In selecting the cockerel be careful of his pedigree, and watchful that the stock from which he is purchased has not been subjected to in-breeding to any great extent. New blood thus infused in the flock will surely show its good results directly. The influence of new blood is extremely encouraging to the breeder, as it is the foundation on which the life and hope of hardy constitutions depend.

Drawn and Undrawn Poultry.

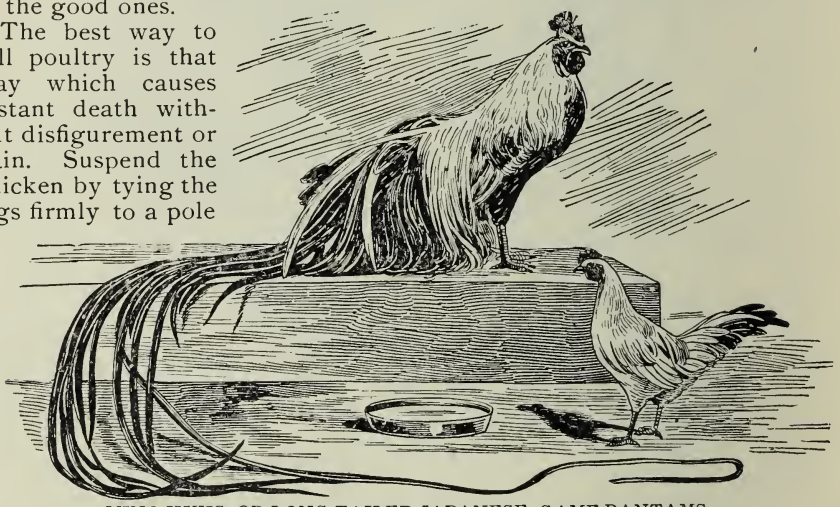
Drawn poultry has heretofore been the most popular for shipping purposes. Experience has proven that the safest and best way to ship poultry is in the undrawn state, as the following examples will show: On February 5th two turkeys were killed; the intestines of one were removed; the other was left undrawn. The birds were hung in a room where the temperature was about the same as that outside. On February 12th there was a slight odor from the drawn turkey, while the other showed no signs of any change. On February 13th, the drawn turkey had a stale smell and began to drip. Still there was no apparent change in the undrawn one. February 14th there was considerable odor from the drawn one, but there was no evidence of decay from the undrawn one. The flesh was removed from the breasts of both birds on the 15th. The meat from the drawn turkey gave forth a strong, disagreeable odor, while that from the undrawn was sweet and fresh. On the 16th both turkeys were laid open, and the drawn turkey was in a bad

state of decay, while the undrawn bird was found to be in excellent condition, not the slightest decomposition being discernible. These observations are conclusive proof that undrawn poultry is the best for shipping.

Dressing and Marketing Poultry.

The condition of dressed poultry when sent to the market largely determines the price. Frequently poultry raisers complain of the low price they get for their chickens when in truth the specimens sent should have been used for home consumption rather than for marketing. Poultry which makes a good show always meets a ready sale and brings good profits. Poultry dressed and packed in every conceivable way, without regard to appearances, seldom pays the shipper for his trouble, and, as a rule, he literally has to give it away to get it off his hands. This is wrong. A few poor birds in a crate of good ones ruin the sale of the whole lot as first-class birds, and injure the reputation of the shipper. It would be better to throw away the absolutely poor ones than to lower the price that may be realized from the sale of the good ones.

The best way to kill poultry is that way which causes instant death without disfigurement or pain. Suspend the chicken by tying the legs firmly to a pole



MINO HIKIS, OR LONG TAILED JAPANESE GAME BANTAMS.

or heavy wire across the killing room at a convenient distance from the floor. Open the fowl's beak with a sharp-pointed, narrow-bladed knife, and make an incision at the back of the roof of the mouth, dividing the vertebra. Another painless way of killing is to sever the veins in the neck, and leave hanging until properly bled.

Keep fowls without food for at least twenty-four hours before killing, as full crops injure the appearance and are likely to sour. This of course lowers the value of the bird.

Dry-picked fowls present a plumper appearance when dressed; besides, the feathers may be thus saved for marketing. In order to realize the best prices for feathers they should be kept separate; that is, each kind and color, as well as the large and small, should be kept apart. When dry picking is done it is necessary that the feathers be taken off while the body is still warm; the sooner the easier and better the work can be done, and with less danger of tearing the skin. Pull the tail and wing feathers first; then those on the breast and back, finishing with the



FIG 1.

legs. Sort them out as picked and keep dry and clean. After taking off the first feathers clean the fowls carefully, wash out with cold water, and then hang up to drain out and cool.

If the fowls are to be scalded before picking have the water near the boiling point. Take the fowl by the legs and dip carefully into the water, lifting up two or three times in order to wet thoroughly. Take out whenever the tail or wing feathers will pull easily.

It is essential that all animal heat should be out before packing. More loss is occasioned by failure to see to this than by any other cause. A good plan is to kill and dress the fowls late in the evening; then hang up over night.

For packing poultry provide boxes, for they are preferable to barrels. Place a layer of rye or wheat straw thoroughly cleaned from dust on the bottom. Commence packing by bending the head of the first fowl under the body (see Fig. 1.) Then lay it in the left hand corner of the box, with head against the end of the box and back up. Continue in the same manner until the row at the end of the box is filled. Then begin the second row, letting the head of the first bird of that row pass up between the two adjoining birds, which will make the whole solid and firm (see Fig 2.) In packing the last row reverse the order, placing the head against the other end of the box, letting the feet pass under each other. Fill the spaces left with straw. Over this first packing put a layer of straw thick enough to prevent the birds coming in contact with the next packing. Add other birds in the same way until the box is filled. Care should be taken that the box is full enough to preclude disarrangement in transit. It would be advisable for those who have extra fine fowls to wrap each one separately in manilla paper before packing. This will prevent dust and straw adhering, and will add much to their appearance. The box should have the initials of the consignor, the number and variety of contents, as well as the name and address of the consignee marked on it.

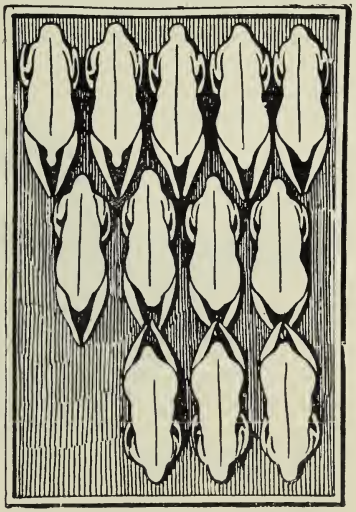


FIG 2.

Shipping Eggs. Eggs intended for market should be gathered daily and cleaned of all spots and dirt before placing in the crates for shipment. A better price can be had for eggs that are clean and neat in appearance, than for eggs that are sold as gathered from the nests. Before crating the eggs assort them in colors and place as far as possible eggs of the same color in each crate. That is, place all white shell eggs in one crate and all brown shell eggs in another. By assorting them in this manner they meet with a more ready sale than when all colors are mixed together as is the usual custom. Eggs that are cleaned and assorted are

classed as "fancy stock," and usually claim regular patronage at advanced prices.

There are many ways of packing eggs for shipment, but the most reliable as well as the most practical method is in crates as shown in the illustrations. Fig. 1 shows a case that any one can make, and it may be used to an advantage. Any size box may be used for this purpose; make paste-board partitions to fit the inside of the box; have a partition for each layer of eggs in the box. Cut strips of paste-board a little larger than the egg, to divide the tiers in rows, preventing the eggs from coming in contact and breaking. Over each layer place cut straw or excelsior to fill up the spaces around the eggs and the edge of the box. Repeat this until the box is full; then securely fasten down the cover and address the box to whom it is to be sent.

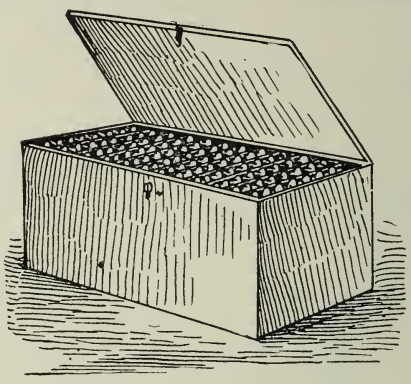


FIG. 1.

The suspension egg carrier, as shown in Fig. 2, is probably the most secure. This carrier consists of an outside case or crate, in which are fitted a number of trays with cord laced through the side and ends, dividing the spaces into small squares, which make a delicate spring and responds to the slightest jar. Rows of pockets are suspended from the cord work, giving each a separate apartment so arranged that no jar or jolt the carrier may receive can cause one egg to strike another. By crating eggs in this manner it affords a free circulation of air around them, which prevents spoiling in warm weather. There is also a protector to cover each layer of eggs which keeps the eggs in position should the carrier be overturned. These carriers are made of various sizes. Eggs shipped in them are sold to the purchaser without recounting. The size usually used contains thirty dozen.

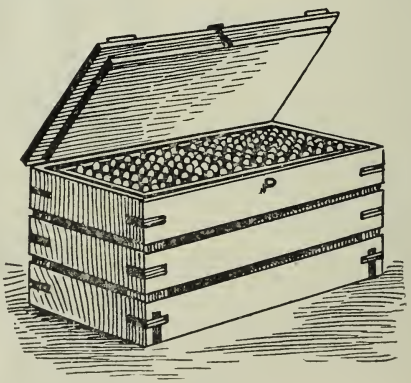


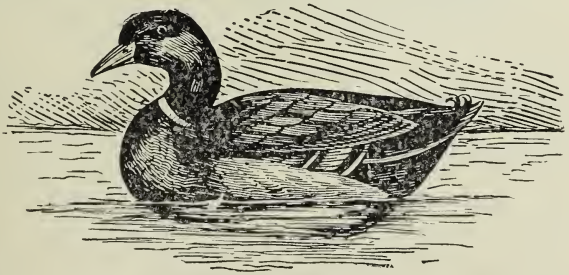
FIG. 2.

Warm Weather Management.

THE poultryman's hopes rise at the first signs of spring to the heights of expectation for the coming season. There are many things to do, and the doing of them properly calls for all the knowledge obtainable, if anticipations are to be realized. No time can be lost in beginning the spring cleaning, mating the breeding stock and hatching the broods which are to be the source of profit. Energy and system at this time will operate satisfactorily, and to the advantage of the breeder and his flocks.

Operations should commence with the cleaning of the house and yard after the winter use, to adapt them for warm weather purposes. Begin by cleaning every nook and corner and brushing all dust away. Clear the floor of litter, and replace with clean material; empty all the nests and see that no filth is left to breed vermin; remove all nest boxes and roost poles from the house and cleanse them with kerosene; whitewash the nest boxes inside and outside. After the house has been cleared apply a liberal coat of whitewash, containing a small amount of crude carbolic acid, to every portion of the building; and slush it into the cracks and crevices, thus killing all the vermin that may be concealed in them. Replace the roost poles and nest boxes and use fresh material for the nests. Sprinkle the nests with Persian insect powder. Dust the fowls thoroughly with the powder to keep down the lice as far as possible, and be liberal in its use, that no regret may be found in the future when the warm weather comes.

When the weather was cold every crack was closed to prevent draughts. Remember that now more ventilation is necessary and the houses should be regulated accordingly. There must be an abundant supply of fresh air in the house. If the fowls have been confined it is necessary that the yards also be cleaned. Spade them up and mix with the soil fresh gravel, sand and lime. If the birds are on a range, it will be well to clean around the house door and feeding places, and haul the scrapings off to the garden or orchard. Provide ample shade for the birds during the summer days, as they need it for protection against the hot rays of the sun.



GRAY CALL DUCK.

Mate up the pens of breeding birds as early as possible and be ready to hatch when the weather is favorable. Place the best birds in the pens, and breed from those only that are known to be in perfect health. Vigorous adult birds give chicks that develop into fine birds for the next season's layers.

When fowls are allowed free range in warm weather, it is not essential to feed them more than once a day, as they gather food which

nature supplies and is all that is needed for their food during this period. But when fowls are kept confined a study of their feeding is of as much importance in summer as in winter.

When the weather is cold it requires more food to sustain life than it does during the heated term. Do not allow the fowls to become overfat, as disease is likely to occur. Avoid all fat-forming food during this period and keep them in a thrifty, vigorous state by feeding such foods as are not heating. Feed liberally of the bran mash in the morning, and use wheat and oats as grain foods during the day. Cooked vegetables and cut grass may be used during this period, as they are bulky and not stimulating. Milk, buttermilk and clabber are good drinks and the fowls relish them.

At no season of the year should more attention be paid to the drinking water than in summer. The vessels should be rinsed in the morning and filled with fresh water. Place the vessels in a location where the sun cannot reach them, and when possible, change the water several times each day. Occasionally put in the water, a few drops of carbolic acid as a safeguard against disease, and during the moulting period a small amount of tincture of iron should be used as a tonic.



PAIR SULTANS.

Cold Weather Management.

In the previous chapter was given a synopsis of the care of the fowls when in a growing state, and when nature supplied, to a great extent, the food needed for their development. But now these conditions have changed. The fowls have developed into maturity, and the biting frosts have deprived the birds of insect or animal food. This is the season when the poultryman reaps the benefit of his labors; it is at this time when the income is to be had from the summer work. All conditions are now changed; the treatment of the flock is in a measure the reverse of that during the warm weather.

The foundation of the winter's success is based on proper housing of the birds. The houses should be made warm and perfectly dry, with sufficient light. It is best if they be so arranged that the sun will



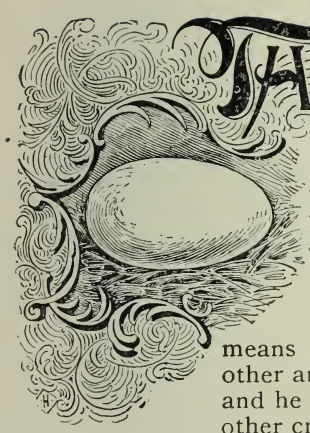
AYLESBURY DUCKS.

shine into the building the greater part of the day. Ventilation is not needed to any great extent, as too much ventilation does more harm than good. If the house be large and there be plenty of room for the accommodation of the flock kept, there is no need of ventilation. Do not over-crowd the flock, as poor results are sure to follow, and the birds cannot possibly thrive in an unfavorable condition. See that no cracks or crevices are in the sides of the house to admit cold draughts on the birds while on the roosts. Dampness is to be avoided by having a tight roof and a board floor.

Before placing the birds in winter quarters, whitewash the house and thoroughly clean it. Cover the floor with cut straw or dry leaves to a depth of six or eight inches, for the hens to scratch in for the grain food during the cold weather. In one portion of the house provide a box of dust for the fowls to bathe in; this bath is best made of dry earth and a small amount of powdered sulphur mixed together.

The supply of eggs during the winter months depends largely upon the temperature of the house, and the method of feeding. The latter subject has been discussed at length in another chapter, and it is not necessary to dwell further upon it here. The water supply should be ample, and the morning drink should be warmed to about sixty degrees. When the fowls come off the roosts on a cold morning they are cramped and chilly and something warm is needed for them before going into the cold. If they drink warm water it has a tendency to assist the circulation of the blood. Remember that the bird must be kept in active exercise during the winter to be healthy and profitable. A lazy bird soon becomes diseased; it is a worthless adjunct to the yard. To prevent laziness cause them to work for their living by scratching in the litter on the floor for their grain. This will keep them in good health.


SILVER PHEASANT.
HOWARD
CHINESE EARED PHEASANT.



WHEN we look at an egg we do not comprehend what a wonderful thing it is. Many people look on an egg as a very ordinary thing, and never give a second thought to it, nor of what it is composed, nor for what purposes it may be used. The word is of Saxon origin and was spelled *aeg* or *oeg*. Johnson says the term means "That which is laid by feathered and some other animals from which their young is produced;" and he further speaks of it as "the spawn or sperm of other creatures," as fish are said not to lay eggs, but to spawn. Another authority defines it as the "*ovum* of birds," giving us here the Latin word for egg, hence that peculiar shape is called oval, and the science of eggs is called oology.

The egg is the germ or seed of the animal life; in it is contained all that is necessary for the formation of a perfect living creature, and within the shell is all that is necessary to make the bones, muscles, sinews and the delicate organs. These are all there in an undeveloped state; by this we mean that the animal is there in *embryo*.

Dr. Harvey, who made the great discovery of the circulation of the blood, says that every animal is born of an egg. The first stage of animal life may be compared with an egg. All animals were at one time alike, mere specks, surrounded by fluid matter which affords the material for growth and nourishment, and inclosed in some kind of a case, which, if not an egg shell, answers the same purpose of protection from injury. In each of these there exists the germ, which is but a tiny speck attached to the membrane that surrounds the yolk which affords nourishment to the animal embryo. The yolk is in proportion to the quantity that is required to sustain life until the protection of the shell is no longer needed.

"The nature and construction of the egg is like a series of cases or envelopes" says Adams, "one within the other; the outer only, which is the last one formed, being hard and unelastic; that is, it will not stretch or change in shape, and is composed of carbonate of lime, which the animal has the power of secreting from its food. Next to the shell is a skin called the *membrane putaminis*. This is divided into two layers, which separate at the larger end and leave a space called the *vesicula æris*; this contains the air necessary for the chick to breathe before it chips the shell. Enclosed in this membrane is the albumen, which is suspended by little cords called *chalaza*, which has connection between the suspending cords and the germ, in which is the vital principal. Next is the yolk, which is called *membrane vitelli*, or the skin of life. This serves for food for the chick until hatched."

There are in the egg the three necessities for existence—protection, the shell and the albumen; the nutrition, the yolk and food; and the vital principle, or germ. This little spot in the centre of the yolk, after



FIG. 1, THIRTY-SIX HOURS.

twelve hours' incubation, assumes an irregular outline, with a tendency to shoot or spread out on all sides. Four hours later they are still more enlarged, and are then assuming an oval shape, with a distinct, though somewhat broken line down the centre. At thirty-six hours there is still greater increase in the germ, (Fig. 1,) and a spreading of its mottled margin over a portion of the yolk. On the fourth day the chick is a still more strange looking object, with projecting eyes with large rings around them (Fig. 2). The first resemblance to a chick is on the tenth day, (Fig. 4,) when the bones have begun to form. A great change has been going on in the interior; the chick has increased in size, the red veins have become more numerous, and have spread over the entire surface, while the yolk is scarcely distinguishable from the other portions. The pupil of the eye has become distinct on the eleventh day, and the projection of the wings and the stump of the tail are clearly perceived.



FIG. 2, FOUR DAYS.

Larger and larger the creature grows, until it fills all the space and has to be doubled up in a curious manner, with the feet and head brought together and the bill close to the shell. On the twenty-first day the chick chips the shell. Some suppose that the parent bird does this, but it is not so. It is done by the chick within. As if to assist in the work of opening a passage to liberty and light, there is on the tip of the chick's bill a small horny scale, having at the centre a hard and sharp projection, which from the position of the head is brought into direct and constant contact with the inner surface of the shell; this scale soon loosens and falls off after the chick leaves the shell.



FIG. 3, SIX DAYS.

The accompanying illustrations clearly show the evolution of the chick in the egg, and demonstrate what a wonderful thing the egg really is. In the adult birds we must look for the vigor of the germ, from which the young are to be hatched, and every effort should be exerted to produce strong, healthy chicks. To do this the breeding stock must be vigorous, or the egg will be lacking in vitality, and the chicks will be weak. Care and attention alone will give us this result, and as the chick comes from the egg, so the qualities that are essential to the maturing of a healthy chick must be transmitted from the adult bird to the germ in the egg. When the chick is released from the shell in a strong condition, its chances of living are more certain, and it will more easily withstand disease.



FIG. 4, TEN DAYS.

INCUBATION.

Natural Incubation.

The sitting hen is a provision of nature for hatching chicks, and is peculiar to the feathered tribe alone. This natural incubation affords study for all, and there is much knowledge to be gained from their habits while sitting. In the wild or natural state they generally locate their nests in some secluded spot or on the ground. The earth being a poor conductor of heat, retains that imparted to it from the bird's body, while its moisture, together with that imparted from the bird, prevents an undue evaporation of the water contained in the egg. This is the natural method of incubation, and success by artificial means depends upon supplying like conditions.

For setting, fresh eggs are needed to produce vigorous stock; the fresher the eggs the better, as they hatch more promptly and chicks are more active and thrifty. In locating the nest it will be well to place it upon the ground; but if this be not practicable, earth may be placed in the nest-box.

The nest-box should always be large and roomy, so that the hen will not be crowded while on the eggs. Fig. 1 is a box fifteen inches high, sixteen inches square, and has a lattice door in front to keep other hens from troubling the sitter. The top of the box is made of laths, which afford a free circulation of air. There is no bottom to this nest. It should be placed upon the ground. The lattice door is so arranged that it may be removed to allow the hen to leave the nest for food.

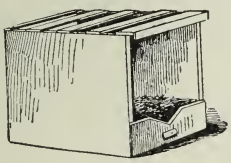


FIG. 1, THE NEST.

In the nesting material sprinkle Persian insect powder; also sprinkle the hen before placing on the eggs. Repeat this once every week during the sitting period. When the hen is taken from the nest with her brood, she should again be sprinkled with the powder, and each of the chicks should be slightly touched on the head and throat with a small quantity of sweet oil or lard. They should then be removed to the brood coop, and cared for, as stated in other chapters.

The method employed for testing eggs and showing the development of the chicks within the shell is shown in the accompanying illustrations. The time for testing eggs is on the fifth or sixth day, when all clear or infertile eggs should be removed from the nest. To test the eggs remove the hen from the nest, and hold each egg near the light, in the manner shown in Fig. 2, between the eye and the light. The eggs may be tested to an advantage in this way, but a better plan would be to use the egg

tester, which more clearly shows the germ, owing to the peculiar construction of the tester. In Figs. 3 and 4 are shown egg testers which are simple in construction, and can be made at a very small cost.



FIG. 2, HOLDING THE EGG.

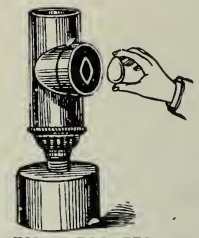


FIG. 3, EGG TESTER.

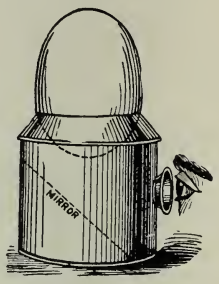


FIG. 4, EGG TESTER.

The appearance of the eggs as seen through the testers is clearly shown in the following illustrations: Fig. 5 shows a strong fertile egg, as seen on the sixth or seventh day. B, the dark spot, is the live germ; A, A, are the blood vessels extending out from it. This germ B is seen by placing the eggs against the aperture of the tester, and revolving it between the thumb and finger until the side on which the germ has formed comes nearest the eye. The spot B will be seen very distinctly, and is often surrounded with a cloud, as shown in the figure. This is a very strong healthy egg and should hatch under a hen or in an incubator. C shows the average air space in an egg on the fifth or sixth day. Fig. 6 shows a weak or imperfectly fertilized egg. H is an oblong or circular blood vessel which has started; there is no part of the chick in the formation. This egg will not hatch. C is a small dark spot, a weak germ without blood vessels. F is the air space. Fig. 7 shows a stale egg, which is generally distinguished by the very large air space E. When an egg shows a clouded appearance, as in D, it is certainly stale and will not hatch. In an unfertile fresh egg you can see the yolk, which looks somewhat darker than the rest of the egg, but does not look muddled. Fig. 8 shows the size of the air space in a fertile egg on the 16th day. K is the space occupied by

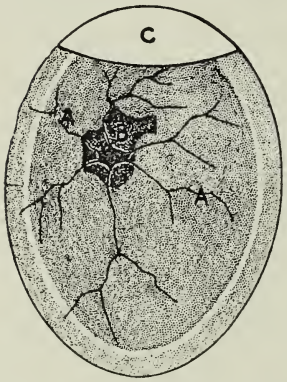


FIG. 5, A STRONG FERTILE EGG.

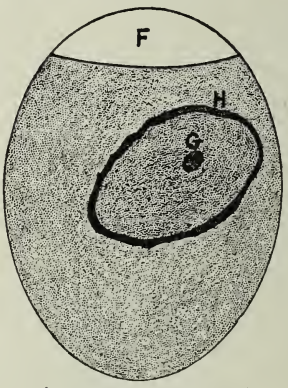


FIG. 6, A WEAK OR IMPERFECTLY FERTILIZED EGG.

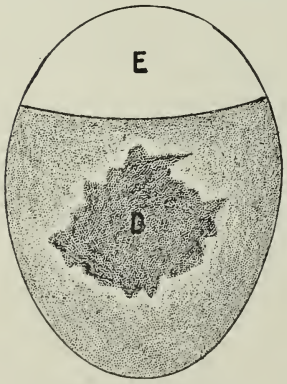


FIG. 7, A STALE EGG.

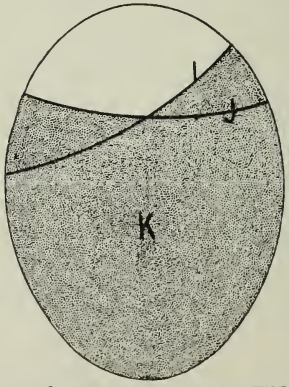


FIG. 8, THE AIR SPACE ON THE 16TH DAY.



the chick; the lines I & J show the air in the bulb, which may be on top or at the side, as indicated by the lines.

Artificial Incubation.

For generations past the secret of artificial incubation has been in the keeping of the Chinese and Egyptians, who undoubtedly learned the art from careful observation of the turtles and alligators, whose eggs were hatched by the sun beaming on and warming the sand in which the eggs were deposited. It is recorded that De Reaumurs, the French scientist, as early as 1750, perfected a process of artificial incubation, which, though successful, was not practical for ordinary purposes. It has been within the last twenty-five years that artificial incubation has been brought into practical operation. The numerous successful machines now in operation elevate the subject from theory and demonstrate to all that this branch of the poultry industry is an important factor in the raising of chicks. To-day thousands of chicks are hatched by artificial methods and they are in every particular equal to those hatched by the natural means.

The mission of the incubator is to replace the hen for hatching purposes, and by so doing the labor and care needed to set and raise a single brood of chicks under a hen may be used to operate a machine, and the results will be many fold greater with the same outlay of time and trouble.

The hens supply the heat and moisture to the eggs in the same manner as the machine will do when in operation. The hen bears no more relation to the egg than an incubator after she has laid the egg in the nest; nor is her maternal instinct sufficient to recognize an egg laid by her from that of another hen, nor to distinguish her offspring from that of a turkey, duck, goose or pheasant, and she will mother any bird she hatches.

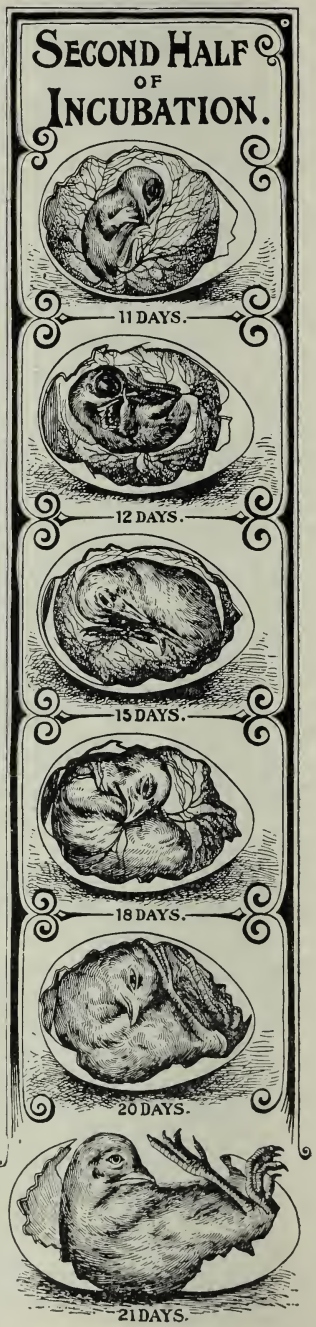
The incubator is intended to supply heat and moisture to the egg without any regard to the shape or style of its construction. A machine should be so built as to regulate the temperature for a sufficient period and keep the heat uniform in the egg tray. This heat should be that of the hen's body or between 101 and 103 degees. It should be

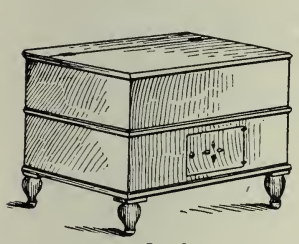
kept as near this as possible during incubation, but it has been found that the temperature may rise as high as 110 degrees without injury to the eggs, provided it does not remain at that point more than a few minutes; or it may fall to a very low point for a short while.

In operating an incubator the conditions surrounding it have much to do with its success. These the operator must study and learn by practice. Many theories have been advanced by persons who have obtained certain results under given conditions, and when tried by another the attempt has proven an entire failure in every detail. A close observation of the machine under the conditions directly surrounding it must govern the operations of it and not the theories of others. Try the machine thoroughly before filling it with eggs, and then watch the development with care and patience in attending to the details of the hatch.

A good plan for an incubator is the following, which is taken from the Youth's Companion. It has no way of regulating the temperature other than is found in its construction.

Make a pine box somewhat like a common washstand, without the inside divisions, as shown in Fig. 1. About a foot from the floor of this case place brackets like those shown in Fig. 2, and on a level with these screw a strong cleat across the back of the case inside. They are to support the tank. The tank should be made of galvanized iron, three inches deep and otherwise proportioned to fit exactly within the case and rest upon the brackets and cleats, as shown in Fig. 3. At the top of this tank in the centre should be a hole an inch in diameter with a rim two inches high, and at the bottom, towards one end, a faucet for drawing off the water. When the tank is set in the case, fill up all the chinks and cracks between the edges of the tank and the case with plaster of Paris to keep all the fumes of the lamp from the eggs. Fill the tank at least two inches deep with boiling water. To find when the right depth is acquired guage the water with a small stick. Over the top of the tank spread fine gravel to the depth of a quarter of an inch, over this lay coarse




FIG. 1

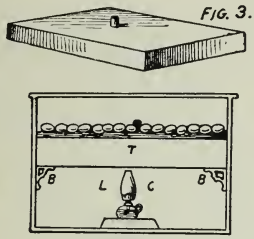
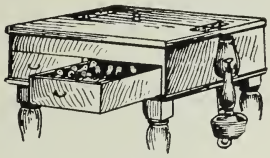


FIG. 2.

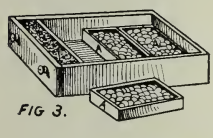
FIG. 3.


FIG. 4

YOUTH'S COMPANION INCUBATOR.

cotton cloth, and set a safety kerosene lamp under the center of the tank The door of the lamp-closet must have four holes for ventilation, otherwise the lamp will not burn. The lamp-closet is the space within the incubator under the tank. Turn the eggs carefully every morning and evening, and after turning them sprinkle with quite warm water. Thermometers should be kept in the incubator, one-half way between the centre and each end. The average heat should be 103 degrees. If the eggs do not warm up well, lay a piece of coarse carpet over them; but if they are too warm take out the lamp and open the cover for a short time, but do not let the eggs get chilled. If it is desired to have top heat, the same sort of a tank is required but a boiler must be attached to the side with an upper and lower pipe for circulation. A plumber can attach the boiler for a small sum; the faucet must be at the bottom of the boiler on one side. The drawers containing the eggs should slide beneath the tank. A stand for the lamp should be screwed to one end of the case in such a position as to bring the lamp under the boilers, as shown in Fig. 4. To cool the incubator raise the lid, turn down the lamp and pull the drawers part way out.

Another plan of incubator that has given good results is the Farm and Garden Incubator. To make this machine use boards one inch thick and twelve inches wide. Cut them forty-two inches long for the


FIG 3.

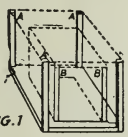
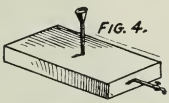
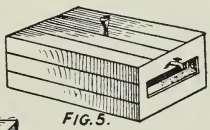
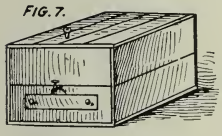


FIG.1


FIG. 4.


FIG.5.


FIG. 7.

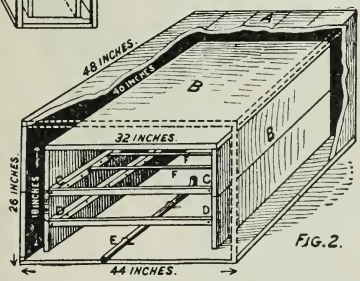
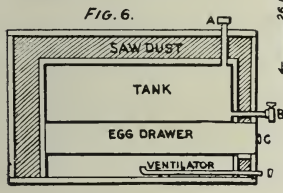


FIG.2.



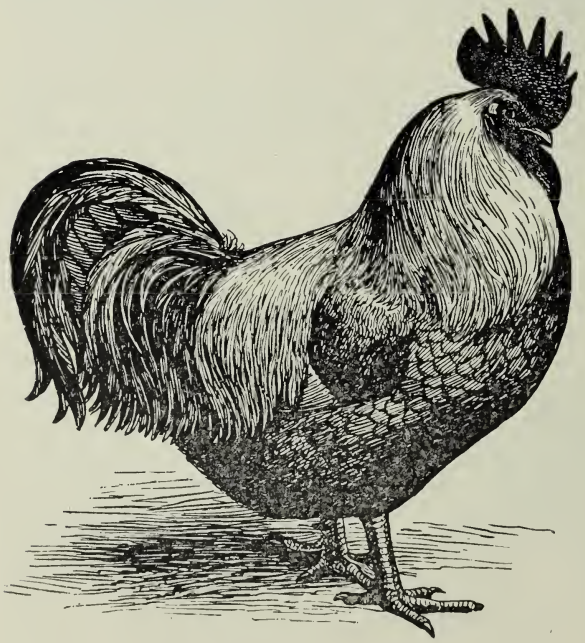
FARM AND GARDEN INCUBATOR.

floor, and make forty-two inches wide. The corner posts are twenty-four inches high, marked A, Fig. 1, and the two posts B, in front, are twelve inches high. The posts are made of 2x3 stuff and are nailed securely to the floor. The four corner posts are for the outer box, which,

when finished, is four feet long and forty-four inches wide, outside measurement. Including top and bottom the machine is twenty-six inches high. Nail on your side boards, and have the front end boards cover the end of the side boards. Tongue and groove boards should be used for the entire machine, except the floor, which should be of heavy boards.

The inner box is forty inches long and thirty-two inches wide, outside measurement, and holds a tank thirty by thirty-six inches. The side boards are nailed to posts B, Fig. 1, and front boards of the outer box, and are fastened at the rear end by the rear boards being nailed to the ends of the side boards. Fasten the inner box to the floor with cleats. Fig. 2 shows the construction of the inner box quite clearly. A is the larger, or outer box; B is the inner box; C are strips one inch wide and one inch thick, nailed to the sides of the inner box; D are strips one inch thick nailed to the sides of the inner box. The strips C, with the iron rods, extend a little into the sides of the inner box, to assist in supporting the weight of the tank. The strips D are to hold the egg drawer. E is a tin tube, one and one-quarter inches in diameter and two feet long, placed in the front part of the ventilator to admit air In this cut the sawdust is not shown in front.

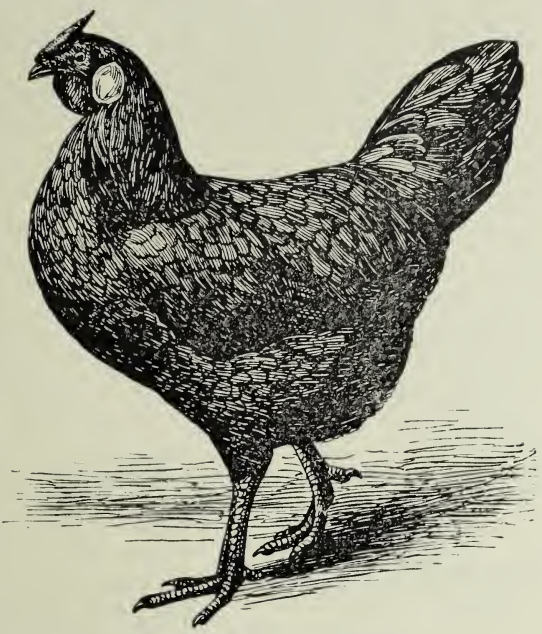
The ventilator is in the bottom of the inner box and is under the egg drawer, five inches deep and thirty inches wide. The front end is boxed off, which includes the front boards and also the sawdust, which makes the ventilator, inside measurement, thirty-six inches long. The bottom of the ventilator should be papered, so that no air can enter except through the tin tube. The tin tube is open at the front on outside of the incubator and enters into the ventilator.



SILVER GRAY DORKING COCK.

The egg drawer is under the tank, and rests on strips D, as shown in Fig. 6. By outside measurement the egg drawer is four inches deep, thirty-nine inches long and thirty inches wide. Fit in the drawer three movable trays, one and one-half inches deep. Nail strips an inch wide and five-eights of an inch thick one inch apart the length of the egg drawer, but not under the boxed off portion, for the bottom. Mortise ends of strips in the egg drawer so as to have the bottom smooth. Tack a piece of muslin to these strips (thin muslin is best) and also tack it on the

inside of the drawers. Nail strips to the bottom of the trays one inch wide. They need not be mortised, but may be nailed on the bottom, one inch apart and running lengthwise; tack muslin on the inside of the bottom of the trays the same as in egg drawer. The inside of the drawer is three inches deep. The sawdust in front of the egg drawer (the boxed portion) fits in boxed front of incubator, as shown in Fig. 3. A broad cap should be placed on the outside of the egg drawer to exclude the air. The tank as shown in Fig. 4, is thirty by thirty-six inches, and is seven inches deep. It is supported by strips C, Fig. 2. It fits close to the back boards of the inner box, and the front is inclosed by sliding boards, secured by one inch upright strips at each end of board. This leaves a small space in front of the sliding board to be filled with sawdust. The tube should be threaded and should extend through the sawdust in front for the faucet to be screwed to. The tube at the top is seven inches long, and extends through the sawdust and also through the outer and inner box, as shown in Fig. 5. This is the incubator complete, and the opening into which the egg drawer enters when filled with eggs, clearly shows the sawdust packing in front.



BLACK HAMBURGH PULLET.

Fig. 6 is a sectional view of the incubator and shows the different parts. The boxed off portion in front is filled with sawdust. The side boards of the inner box are joined on their front ends to the front boards of the outer box and are also nailed to the two short middle posts. The space between the boxes is filled with sawdust, chaff, oats or finely cut hay, packed solidly. Use sawdust when possible. In Fig. 6, A is tube on top, B the faucet in front, C the opening for the egg drawer, and D the tube to admit air into the ventilator. The ventilator tube should be placed as close to the bottom as possible. Use putty around the openings, where the tin tubes enter the boxes, to keep out the air. Fig. 7 shows the incubator complete.

The capacity of this incubator is 240 eggs. Eighty eggs to each drawer. Fill up the tank with boiling water to the bottom of the tube on top It should be filled forty-eight hours before the eggs are placed in it, and the temperature at that time should be about 112 degrees. Do not open the drawers for at least six hours afterwards, as the eggs when first put in will cool the drawer and the heat will then be about 103 degrees, and it should be kept as near this temperature as possible through-

out the entire period of incubation. Learn to manage it perfectly by running a few days without any eggs. The incubator should be kept in a room where the temperature is about sixty degrees.

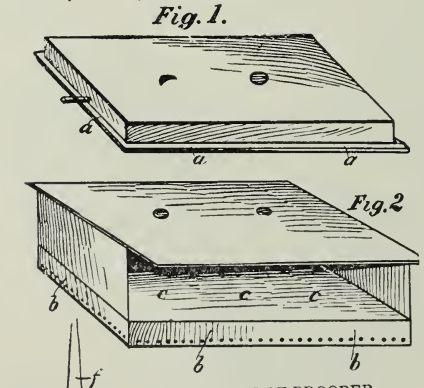
If any difficulty is experienced in raising and lowering the temperature, the trays may be raised or lowered by putting small strips under them. Add a bucket of hot water twice a day, in the morning and again in the evening. The temperature will rise in five hours after the water has been put in.

Place the bulb of the thermometers even with the top of the eggs with the upper end of the thermometers slightly raised, so that the mercury will rise in the tube. The eggs should be turned once a day, and while turning them do not let them cool below seventy degrees. No moisture is needed the first week, a little the second and much the third. Moisture may be supplied with a small sponge dampened with hot water. During the second week one sponge in each tray is sufficient, and two sponges about the size of an egg in each tray will supply all the moisture needed during the third week. A small glass door may be placed in the front of the egg drawer through which to observe the thermometers. The position of the tray should be changed when the eggs are turned, by placing the front tray in the rear.

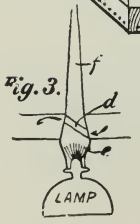
Home Made Brooder.

A brooder that can be easily made is shown in the accompanying illustration, which was furnished by Mr. W. A. Ramsey of Alabama.

Fig. 1 is a tank nine feet long, four feet wide, and two inches deep, over which the house or box Fig. 2 is placed. The lower edges of the house in Fig. 2 rest upon the rim or projection (a, a, a,) of Fig. 1. The walls (b, b, b,) of Fig. 2 stand half an inch away from the sides of the tank. The floor (c, c, c,) of the chicken apartment. is also one-half inch above the top of the tank. The little holes shown in the walls (b, b, b,) admit fresh air. This air spreads all around the tank of hot water. There are one inch tin tubes set in holes through the floor (c, c, c).



PLANS OF BROODER.



The air coming in contact with the tank becomes heated, therefore expands, and becoming lighter, passes up and over the tank, finding egress through the tin tubes into the chamber occupied by the chicks, furnishing them pure, warm air. The tank cannot be made hot enough to rob the air of any perceptible amount of oxygen.

The tank of water is heated by two lamps (Fig. 3). The lamp needs but little description. The tube (d) is one inch in diameter and is set diagonally across the depth of the tank to facilitate the circulation of the water. The flame plays against the tube, and heats the water, which, being expanded, passes out at the upper end of the tube, giving place to cooler water coming in at the lower end.

The chimney (e) is tin, as is also the flue (f). The chim-

ney fits over the projection of the flue under the tank. The chimney should be made short enough to let the flame barely touch the tube.

The lamp occupies an apartment under the tank, the tank constituting the top or cover to the lamp box. Our lamp box is thirteen inches long, hooked at the corners, and has two small doors at the back side, for convenience in handling the lamp.

The lamp we use requires a chimney whose diameter is three inches. Now for the cost: The tank cost six dollars; the lamps one dollar; the remainder, some scrap lumber and time to put it together. Any tinner can make the tank and heater. The material is galvanized iron.

The chamber which the chicks occupy is just over the tank, and is six inches high in the rear and ten inches high in front. The opening in front is closed with a board, which may be hinged at the edge of the floor, and constitute a part of the platform leading from the room to the ground. The roof, by the way, will need a knee to support it at the middle of the opening at the front.

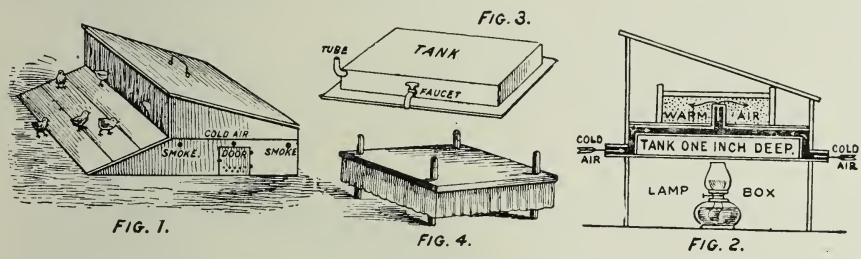


FIG. 1. FIG. 4. FIG. 2. FIG. 3.

PLANS OF LAMP AND TANK BROODER.

A Lamp and Tank Brooder. This brooder is one that has been tried with much success and is easily made at a low cost. Reference to Fig. 1 shows the top is detachable, being lifted off by the handle when desired. Although the lower part of the brooder is above the ground, yet, if preferred, it can be sunk in the ground, provided that holes to admit air to the brooder and emit smoke from the chimney are left above the surface of the ground. Space must be left to permit access to the lamp if the brooder is under ground. Either a number two burner lamp or a small kerosene oil stove may be used for heating the brooder. Be careful to leave air holes at the bottom of the door or the lamp will smoke or go out. Keep the brooder at a temperature of 90 degrees.

Fig. 2 shows the lamp under sheet iron tank. It heats the tank, the smoke of the lamp passing out at the four holes, placed at each corner of the brooder to distribute the heat. The cold air enters around the tank, and is drawn over it above the lamp. The cold air rushes in as fast as the warm air rises. The hot air rises through the tube in the floor. It will be seen that the smoke of the lamp does not go into the brooder, and that the tube in the brooder extends through the wooden floor only. The brooder is a yard square, but the tank may be made smaller; the box containing the lamp is two inches deep, and the square between the top of the tank and the wooden floor is half an inch. The curtain in front of the brooder is simply a piece of cloth cut into strips. The smoke holes of the lamp should be at each corner, but only two cold air holes are necessary, and they should be much nearer the centre of the sides of

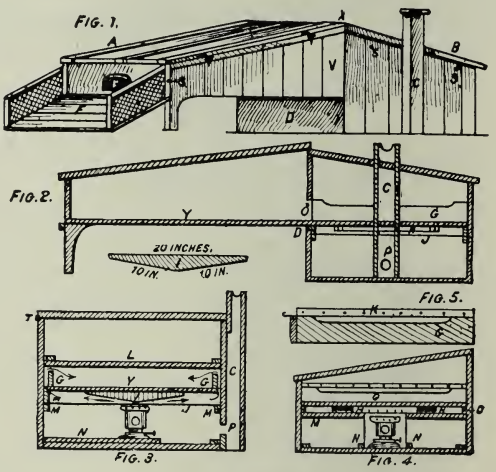
the brooder. Bear in mind that the cold air goes between the tank and the brooder floor, and gets heated.

To make this brooder cut six boards; one inch thick, six inches wide, and three feet long, tongued and grooved, so that no air can come through except by way of the tube on top, which tube is one inch in diameter, and two and a half inches from the floor. These boards are for your floor. On the under side of this floor, at the edges, nail strips all around, on the ends and sides, the strips being one inch thick and one and one-half inches wide. Then set your tank as shown in the cut. You will then have an air space between the floor and tank of one-half inch. Be sure to cut air holes to admit the cold air. You may simply have open holes or you can use tubes, if preferred. The holes need only be half an inch in diameter. You can now easily fit on the lower box, and also make the covering to the top, as may be seen in the illustrations. This machine is made on the plan of the old English brooder, and has been in use for many years. It has been improved several times by the addition of minor details, and it is about all that can be desired. In fact, it may be called a "perfect brooder."

Flg. 1 shows the brooder with lamp and tank above ground. Fig. 2 gives a sectional view of same. Fig. 3 shows the construction of the tank, and Fig. 4 shows the mother which covers the chicks, with adjustable legs or pegs.

A Practical Brooder.

This brooder is one to be highly recommended as a cheap and practical brooder. The design is from Mr. J. H. E. Schultz, of Mountain View, N. J., who describes it as follows:



PLANS OF PRACTICAL BROODER

For the farmer and, in fact, any one not engaged in the broiler business, outdoor brooders are best. For incubator-hatched chicks they are a necessity, and may be used advantageously when chicks are hatched with hens. The brooder here described is large enough for from 50 to 75 chicks, but is better calculated for fifty; with that number it may be used until the chicks are eight weeks old. Of course, everything must be kept perfectly clean; I would advise that the floor be well sprinkled with clean, sharp sand and thoroughly scraped and cleaned every morning.

The material necessary for the brooder will cost about $5, and is as follows: Nine 12-foot matched white pine boards, three-quarters inch thick by six inches wide, planed on both sides; one piece sheet iron 30 inches square; one piece 15 by 20 inches in size; two pieces galvanized iron or zinc 80 inches long by 2½ wide; glass for sash of run; one Little Queen oil stove; four hinges; six hooks; one pound sixpenny and one

pound eightpenny wire nails ; a little putty and paint for two good coats. Fig. 1 shows the brooder finished, with inclined bridge, E, in place. This bridge should be fastened to the end of the brooder with hooks, see S. The sides of the bridge should be made of one-inch-mesh wire or muslin tacked to light frames, or it may be of solid boards. F is the door or exit for the chicks, and should have a slide. V is a ventilating hole two inches in diameter ; there should be one on each side fixed to close with slides. C is a chimney to carry off fumes from the lamp. Including the run, the brooder is 72 inches long by 32 wide ; at the highest point, X, it is 20 inches high ; and at both front and back 16 inches from the ground. The chimney is four inches square by two feet long. A is a sash door hinged to the run ; T T are hinges ; the opposite side should be provided with hooks, like S S, on the back cover or roof B. Hinge both A and B to open on the side most convenient to get at the chicks. A should lap over B, as shown in Fig. 2. B should be of solid boards and as nearly watertight as possible ; dampness is fatal to chicks.

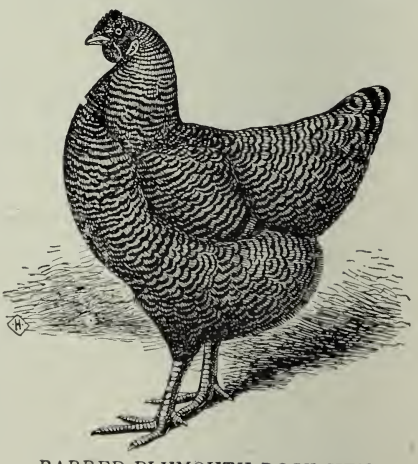
Figs. 2, 3 and 4, show sections of the brooder ; Y is the floor ; J is a piece of sheet iron 30 inches square, firmly nailed to cleats, M, on the four sides of the brooder. In Fig. 4. a hole or door eight inches square is cut, opposite the chimney, for a lamp door ; here the cleat is cut away to admit the top of the lamp and the sheet iron is nailed to a short 10-inch cleat between the floor and sheet iron. Except these there are no cleats at the sides above the sheet iron, as will be explained further. At front and rear, cleats 1½ inch wide are nailed, and to these the floor is fastened after putting in the deflector, H ; this is made as follows : Two pieces of board are made like I, 20 inches long on top, by one and a quarter wide in the centre ; they are to be nailed to the floor as cleats, and must be 15 inches apart from outside to outside, placed as in Fig. 3. To these is nailed the 15 by 20 inch piece of sheet iron. At each end of I, a one-half inch air space is left. This deflector serves a double purpose ; it prevents overheating the floor, and also divides the heat which passes up into the chicken chamber under the hover, as shown by the arrows. The floor in the brooder is one-half inch scant for 30 inches from back on each side, as shown on the right side, Fig. 3. Before fastening the floor, nail on the pieces G G, see Fig. 5 ; they are 30 inches long by three inches high ; at the top of each, a piece is cut out 20 inches long by one-half inch deep, as shown in Figs. 2 and 5 ; now nail in the floor, and there will be a half inch air space on each side. Take the strips of galvanized iron or zinc, bend them as in K, tack them to the sides of the brooder and to the ends of the top of G G ; these are to direct the heat into the chamber under the hover L. The edge that is tacked to G should be neatly folded over, see K. The hover, L, Fig. 3, should rest on top of G G ; when the chicks are first put in, the cleats which fasten it together should be up ; this gives the chicks a chamber three inches high. In three or four days turn the hover over and they will have a four-inch chamber ; the hover should be scant 30 inches square, with one inch cleats on the ends. As the chicks grow it must be raised, or in warm weather after they are a week to ten days old, it may be removed. Do not overheat the little fellows ; place a thermometer on the floor in the centre under the hover. Ninety degrees will be warm enough for the first two or three days, then gradually reduce to 80 degrees and lower. The chicks themselves are the best thermometers ; when they are too cold, they will huddle together, and the weaker may be smothered; when

too hot, they will "move out." When the heat is just right you will find them spread all over the floor and hear contented little peeps. The best way I know to find out the condition of things is to put your hand under the hover and feel for yourself.

The arrangement of the brooder when finished should be as follows: Depth of lamp box from sheet iron to floor, eight inches; heater box between sheet iron and floor, 1½ inch. The cold outside air comes into the heater box through four one-half inch holes, D, Figs. 1, 2 and 4 is warmed by passing over the sheet iron, and is driven up between G and the sides of the brooder into the chick chamber. The lamp must stand *under the centre* of the sheet-iron heater. To make this a sure thing nail two cleats, N N, Figs. 3 and 4, just far enough apart for the bottom of the lamp to slide between them, and at the back nail another cleat or stop; when the lamp hits this it is in the centre. The door of the lamp box must have several holes bored through it to admit air to the lamp. Opposite the door is the two-inch hole P. This opens into the chimney and carries off the fumes from the lamp. Should the lamp smoke, it does not have air enough. It is best to have air holes at the bottom of the door. The run is 30 by 40 inches; the chicks should be kept in this for a few days, then attach the bridge, E, which it is well to cover at the top as well as at the sides, and let the chicks out into a small enclosed run, say 10 feet square. There should be an opening in the side to correspond to that of the bridge. Should the sun be too hot, shade the glass of the run in some way, or there may be roast chicken before it is wanted. Feed and water the chicks in the run.

In building the brooder, put the boards on up and down, see Fig. 1. The first thing to make is the bottom of the lamp box, 30 inches square; this is to have cleats all around except where the lamp enters. By having boards planed on both sides, there will be no waste in cutting the material for the sides. For top cleats, so as not to hinder the removal of the hover, have narrow cleats the same thickness as the sides; nail these right on top of the ends as shown in Fig. 1. The floors of the brooder and of the run are continuous. The legs of the run are made by extending the siding to the ground; they will be about 10½ inches long, which is the depth of the heater and lamp box, below the floor. Muslin may be used instead of glass for A.

When the chicks are placed in the brooder, put a water fountain, made by inverting a deep tin can into a round roast-beef can, or other shallow tin an inch or two larger than the other can. Bore an awl hole into the side of the inverted can about a quarter of an inch below the edge of the shallow tin; by dipping these together into a pail of water, filling both while under the water, inverting the taller can into the other tin, you have a day's supply of water. The shallow tin will remain full as long as water remains in the other can. The first feed for the chicks should

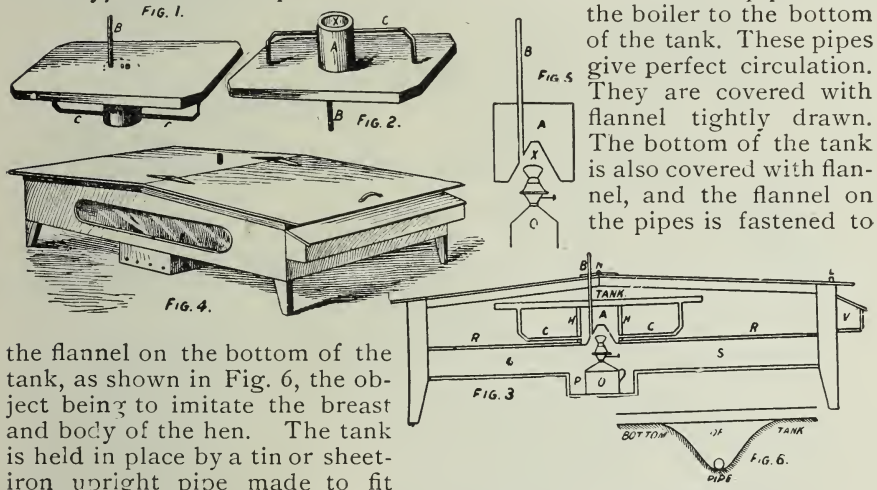


BARRED PLYMOUTH ROCK HEN.

be cracked wheat or oat flakes fed dry, feed little and often, at regular intervals, only what they eat clean. Feed cracked wheat and oat flakes until they are large enough to eat whole wheat and cracked corn. Always keep fine grit and charcoal, about as large as wheat grain, where they can get at it. A little cabbage or onion chopped fine is good for an occasional feed. Never feed anything sloppy. Let them out of the run into their little yard whenever the weather permits. Keep everything clean, and you should raise nice chicks. During warm weather, after the chicks are a week or ten days old, when the sun shines they will not require artificial heat. If the Little Queen oil stove is not procurable, an ordinary hand lamp may be used, but the Little Queen is the best brooder stove that I have ever used. Keep the basin above the oil filled with water, and it is safe and reliable.

A Tank Brooder.

The following design of a brooder is furnished by Capt. Phillips of Chicago, who has been very successful in poultry raising on a large scale. There are many good points in this brooder: Fig. 1 shows the tank, of galvanized iron, 20 by 30 inches, and one and one-fourth inches deep. A is the boiler, of oblong shape, seven inches high, and seven inches in diameter one way and five inches the other. (See Plan, Fig. 2). B is a smoke pipe, or draft chimney, from the lamp. C C are two one and one-half inch pipes from the boiler to the bottom of the tank. These pipes give perfect circulation. They are covered with flannel tightly drawn. The bottom of the tank is also covered with flannel, and the flannel on the pipes is fastened to the flannel on the bottom of the tank, as shown in Fig. 6, the object being to imitate the breast and body of the hen. The tank is held in place by a tin or sheet-iron upright pipe made to fit closely to the boiler. D is the cap, or opening, for pouring water into the tank.



DETAILS OF TANK BROODER.

Fig. 2 shows the tank turned upside down, the parts being represented by the same letter as in Fig. 1, except X, which is explained in Fig. 5.

Fig. 3 shows the brooder and tank set up, but cut through the middle, to show the arrangement. The tank is shown, H being the tank support pipe and R the floor to the brooder. S is a three-inch hot air chamber, the heat from the lamp warming this chamber so as to keep the floor barely warm, never hot. P is the lamp box and O is the lamp. N indicates the hinges, or where the door-top opens, and L the handle.

V is the feed box and is movable. The lamp is the "Gem" lamp, with a one and one-half inch wick, being safe, as it has two inches of water over the oil, keeping it cool. The "Little Queen" will also answer.

Fig. 4 is the brooder complete, the box being four by six feet, one foot high at each end and 14 inches high in the centre, thus giving a slight incline to shed the water. The top is a door or lid, having hinges at the centre, and a handle at the right, and the feed box at the end. On each side, front and back, is a window, six by thirty inches. B is the chimney.

Fig. 5 is a cone-shaped arrangement to the boiler, showing how the smoke is carried from the lamp, B is the pipe and O is the lamp. It is also shown as X in Fig. 2.

Fig. 6 shows how the flannel is fastened to the pipes and to the bottom of the tank.

The brooder uses but little oil after once heated ; will hold 50 chicks, and a run can be attached to it for them. It being a hot water brooder, it holds the heat uniformly and well. This brooder costs but little and can be made by any mechanic.



MANDARIN DRAKE.



THE CHICK.

IF ALL Chicks lived that were hatched, the poultry business would be a decided success from the start. The youngsters are the greatest charge of the poultryman; more anxiety and care are manifested for their welfare than is apparent to the observer. In the chick must be recognized the promises of the adult bird, which is to be the source of profit. All can testify that the care of them during their early life is no small task, if good results are to be obtained, yet by close observance of the laws attached a greater per cent. of the chicks can be raised than is usual.

The first impression to be formed in our minds, is that the chick is a weak little creature when hatched, and certain things are needed to promote its growth. This impression teaches us that warmth, feed, dryness and exercise are necessary to encourage their development into strong and hardy birds. When the chick is hatched the temperature is about 100 degrees before it leaves the shell; this warmth should be supplied as nearly as possible to prevent it being chilled during its first week. A good way is to confine the hen and brood in a close coop well protected from dampness and draughts. By so doing the liability of being chilled in the early morning is prevented, and the brood does not become wet from running in the grass before the dew is off or after the rain.

Great loss is sustained by allowing the youngsters too much freedom. If once thoroughly chilled they seldom recover. Bowel disease results from exposure, and this is the fore-runner of death.

In feeding chicks, keep in view the fact that they feather very rapidly. Chicks do not require any food for 24 hours after hatching. For the first meal feed dry rolled oats. This should be fed for the first day. Stale bread crumbs may be mixed with the rolled oats. Feed all that they will eat up clean but do not leave any food on the ground to sour. Keep in easy access to the chicks powdered charcoal, ground bone, sharp grit or coarse sand. A good food is made by mixing one pound of cornmeal, one-half pound of middlings, one-half pound of ground meat, two ounces of bone-meal, a pinch of salt, and one teaspoonful of bread soda. Moisten with milk or water and bake like bread; crumble and feed every two hours. Another recipe is to bake a loaf of the following: Equal parts of bran, cornmeal, oat meal, and a small portion of linseed meal, seasoned with salt; bake in an oven like other bread. Crumble and feed dry. Never let the chicks run outside of the pen unless the weather is warm.

A good bill of fare for the chicks can be made from the following foods: Cracked wheat, cracked corn, buckwheat, oats, sunflower seed, bread crumbs, lean meat chopped fine, steeped clover hay mixed with bran, cornmeal (scalded) mixed with a little sand, green food—consisting of lettuce heads, cabbage, sugar beets—chopped fine, occasionally a few onions, changing about so that they will have different foods each day. Small chicks should be fed every two hours; the second week the time of feeding can be made three hours, and after that three times a day. Always keep plenty of litter in the pen, such as chaff or cut straw. Give plenty of clean sand. Change the drinking water twice a day, and keep the coops thoroughly cleaned and whitewashed.

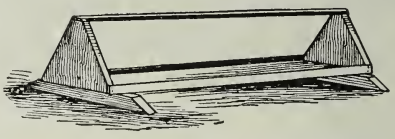


FIG. 1.

When feeding soft foods always use a trough for the same. Do not place it on the ground to sour and mold. Such a trough can easily be made, as shown in the Fig. 1, and is handy to clean after using.

The proper housing of young chicks has much to do with their future. In the construction of coops, dryness and warmth should be first considered. The roof should be water-tight and the floor should be raised from the ground.



FIG. 2.

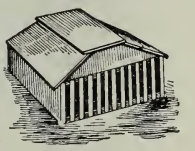


FIG. 3.

Figs. 2, 3, 4 and 5 are excellent designs for coops for young chicks. They are large and give plenty of room for the hen and brood. A very good way is to place them under a low open shed to protect them from driving rains.

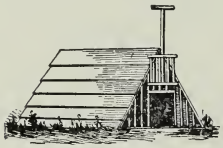


FIG. 4.

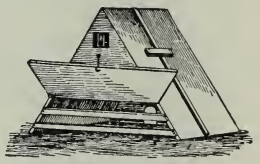


FIG. 5.

Other plans for coops, with runs attached are shown in Figs. 6, 7, 8 and 9. There are many advantages to these coops. By having the hen and brood confined in such pens there is no danger of the chicks becoming chilled by rain and wet. The hen being confined, she is always in easy access to the chicks, and when they become chilled they can go to her. In these runs the chicks are free from molestation by older birds.

A coop that anyone can make with little trouble is shown in Fig. 10. Take an old barrel and tack every hoop on each side of the seam between the staves with one inch wrought nails. After clinching the nails saw off on the seam. Then spread the barrel open, as shown in the cut, by cutting a board 20 inches long for the back of the coop, and two small pieces to tack laths to on the front. The upper section of the back is fastened with leather hinges, so that it may be opened at pleasure.

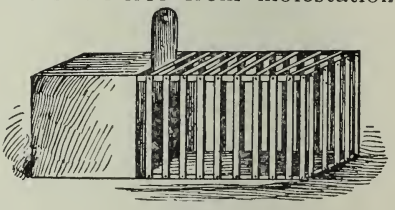


FIG. 6.

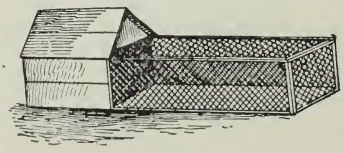


FIG. 7.

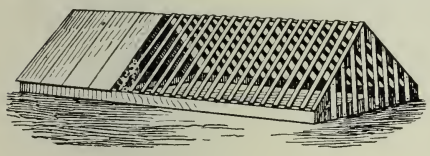


FIG. 8.

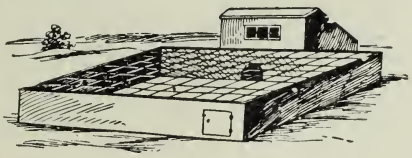


FIG. 9.

When the chicks are a few weeks old a feeding pen should be provided, as shown in Fig. 11. Such a pen will prevent the greedy hens and larger chicks from robbing the little fellows of their food.

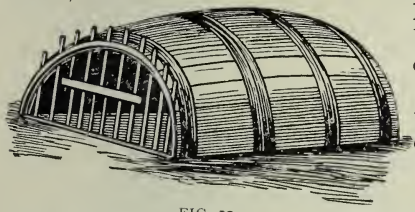


FIG. 10.



FIG. 11.

It is not good policy to allow the young chicks to run with the older ones. It would be well to separate them as early as you can and provide them with a roosting house, as shown in Fig. 12. This house can be built at a small cost. It should be perfectly dry, with low roosts and a lattice front, facing the south. The house should be closed at night. From the time the chicks are weaned until late Fall they can be kept in this house.

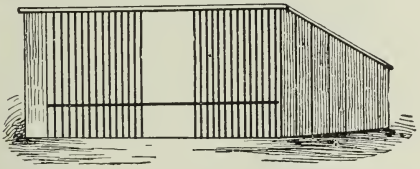
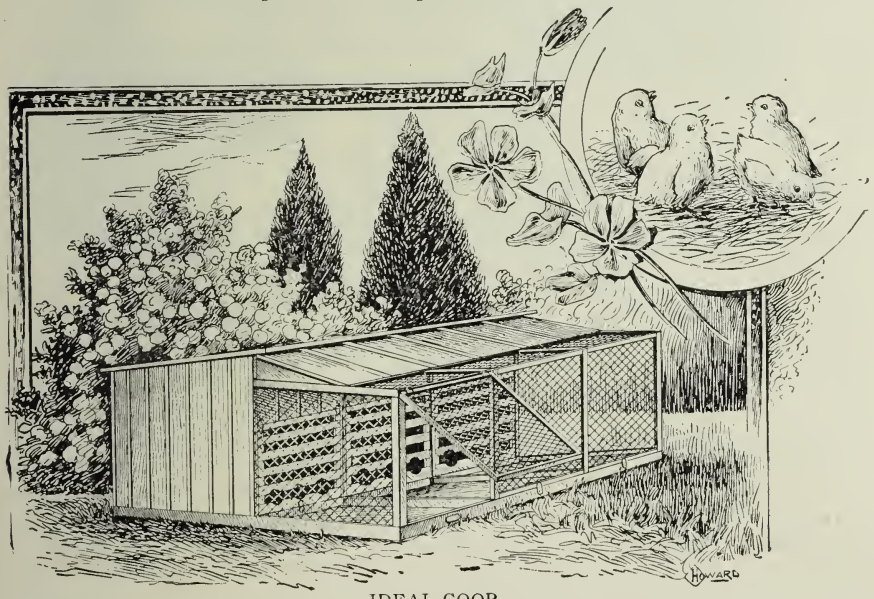


FIG. 12.

Ideal Coop. This coop of our invention, published in the American Agriculturist, is the most elaborate of its kind in this chapter. In this plan the coops are built three in number, on the

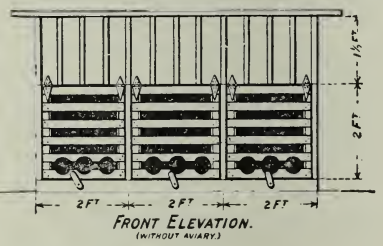


IDEAL COOP.

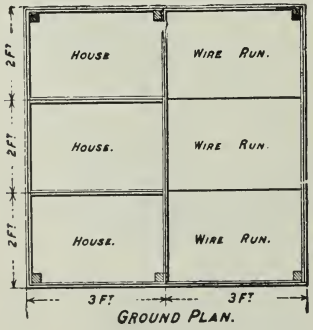
principle that poultry houses are arranged to contain a variety of fowls with separate runs attached. Each division is separate and can be used for one, two or three broods at a time, if desired. The general custom is to have individual coops placed promiscuously around the yard; by this arrangement they are in one spot and easy of attention, saving labor when a number of broods are hatched.

When the hens and broods are allowed to roam at will for the first three weeks, there is no telling how many chicks may be lost before they attain the age to resist the variations of the weather and to care for themselves. By confining them for two or three weeks they are enabled to receive every attention needed for their rapid growth and development; in the coops here shown they are free from the torments of the older birds, or the angry peck of an ill-natured hen as they scramble for food and drink. The mother hen has nothing to detract her attention from the young, and performs her maternal duties in a motherly way.

The ground plan of the coop is six feet square, with three divisions two by six feet each. One-half of the frame is covered with matched boards, to serve as a floor for the enclosed part. The highest part is three and one-half feet, sloping toward the rear; the open portions are covered with one-inch wire mesh. The partitions of the enclosure are solid boards two feet high, with laths at the to afford ventilation; the partitions of wire runs are made of laths, placed one-half inch apart, to avoid fighting between the hens, but permit a free passage of air from one space to the other.



The roof should be made as close as possible, and covered with tarred paper to insure dryness within; the sides should be built of even boards and stripped over the cracks with one-half by three-inch strips. Place dry earth on the floors of the inclosed parts one inch thick, and a little straw in the rear for the hens and chicks to lie on. In the wired parts cover the ground to a thickness of two inches with white sand; this prevents dampness after a rain. Keep the coop well cleaned and whitewashed; sprinkle insect-powder in the corners to keep out vermin. Place water in fountains in the runs; scatter the grain food on the ground and feed the soft food in pans to avoid the waste part souring on the ground. Never feed or place the water fountains in the closed part, as this is intended for roosting only. After taking the hen and brood from the nest, they should be kept in the roosting part for a couple of days; the lattice door separating the coop and the run should be closed during this time to keep the hen confined, but the brood may have free access through the lattice door to the run. After this, the lattice door may be kept raised, and the hen and brood can use the entire space of house and run. When the chicks have grown sufficiently strong, the outer door may be raised,



and the brood can range on the grass during good weather, and be cooped at night until the hen leaves them, when they should be free to range to themselves and be cooped in a different house until they are ready for the pens in the Fall.





BLACK SUMATRA GAME COCK.

RECIPES FOR FEEDING

Elsewhere in this volume the subject of feeding has been treated at length to show the practical methods of using the foods to the best advantage. Under this heading the idea is to substantiate these methods by clearly defining the practices of some of the successful breeders of poultry, and give their experiences in this particular field. A careful perusal of the following recipes will prove of more than ordinary interest on the subject of feeding, by establishing a fixed formula for the preparation of the foods, and illustrating the manner of using them advantageously :

Bran as Food. An excellent combination is to use bran and clover together, sprinkling the bran on the clover. The feeding of poultry on grain only is compelling them to subsist on concentrated food, which is lacking in many substances that are of importance in egg production. The cost of bran is small compared with its real food value, and poultrymen can make it a portion of the regular ration with advantage, as it is not only nutritious, but is also highly relished by poultry. Herewith we give the average of eighty-eight analyses of wheat bran, two analyses of corn bran, and, deducted therefrom, the percentage of nutritive elements contained in a mixture of two-thirds wheat and one-third corn bran :

	Ash. per cent.	Protein. per cent.	Carbohydrates. per cent.	Fat. per cent.
Wheat bran.....	5.80	15.40	53.90	4.00
Corn bran.....	16.45	7.12	50.38	5.00
Mixture.....	9.35	12.64	52.39	4.33

A given weight of the mixture, compared with the same amount of pure bran, would contain nearly twice as much ash, 20 per cent. less protein, about the same amount of carbohydrates and slightly more fat. The *digestible* nutrients in 100 pounds of the wheat bran would be about 11.72 pounds of protein, 44.66 pounds of carbohydrates, and 2.58 pounds of fat. We are not prepared to say what they would be in the corn bran, as we are not aware that they have ever been ascertained. As, however, the fiber is left out in the statement of the contents of both by-products and the question of "woodiness" is thereby eliminated, the digestibility would probably be about the same *proportion* of protein in corn bran digestible as in the protein of the wheat bran, which would make the corn bran contain about 5.25 per cent of protein, or, say, half as much as the wheat bran. This is the chief element for which bran is bought. The mixture would, therefore, be worth about one-sixth less than wheat.

Cooked Food. The poultry raiser who is feeding the little chicks red pepper, carbolic acid and turpentine should stop all that and bake the feed. Mix it up as if you were going to make corn bread for dinner, leaving out the eggs and sugar. Take sour milk, soda and salt, stir in your meal and then bake. When baked, crumble fine, soften and feed the little chicks. Feed them baked corn bread until they are three or four weeks old, and gapes will be a thing unknown in chicks. You can make enough to do two or three days at one time. Save all the scraps of bread, cake and scrapings of all kinds to feed for a change. A large amount of valuable material may be utilized if cooked. Pea pods, string beans, apples, squashes, and many other articles, if placed in a pot and boiled until tender, will furnish a quantity of food that is really more serviceable than too much grain. Ducks and geese may be kept at little expense by this mode of feeding, while turkeys and



PAIR SILVER LACED WYANDOTTES.

chickens will appreciate the change at once. Turnips and carrots, if cooked and fed to all kinds of fowls, will furnish a cheap and nutritious diet, promoting health and preventing too much fat. In feeding such material no grain is necessary except at night, when whole corn, wheat and oats should be given. One of the most valuable foods is cooked potatoes and sour milk. If this be fed, first thickened with ground oats, it will cause the hens to lay more eggs than when an exclusive grain diet is given. Fowls should have plenty of bulky food if they are to be made profitable.—Rural New Yorker.

Clover Chaff. Green food, or some suitable substitute, is reckoned one of the indispensables for feeding poultry. The tender blades of grass and the crisp leaves of lettuce are not always to be had, but there are substitutes for these to be found, among which is the chaff that collects on the barn floor where large quantities of clover hay is fed. This is regarded by the average farmer as worth-



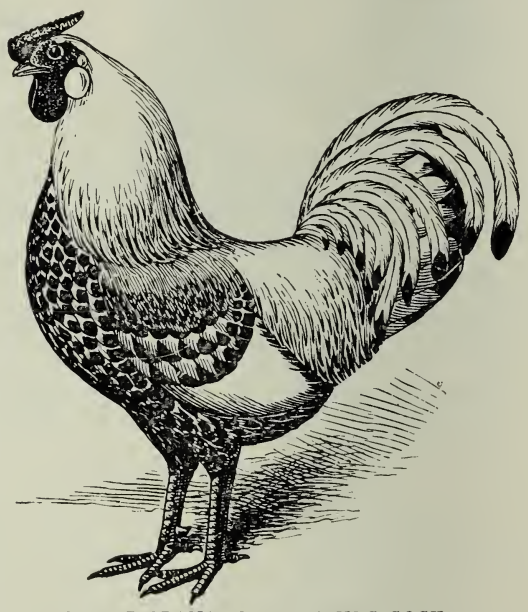
WHITE MINORCA COCK.

less, and is unceremoniously scraped from the floor into the manure pit, or is used for litter for the cows and hogs. Yet it really consists of the choicest parts of the hay, being composed of fine pieces of leaves, broken bits of heads, and a greater or less quantity of clover seed. It is too valuable to waste. It should be daily gathered and stored in barrels or boxes for use. It may be fed in one of three ways. If it be placed in boxes, conveniently arranged for the fowls to get at, so they can not waste it, a large quantity will be eaten dry. It may be rendered more palatable by pouring boiling hot water over it in some convenient receptacle and placing over the mass a cover to keep in the steam and allow it to swell and partially cook. The finest portions of it may be stirred into the soft feed and the fowls will eat it with relish. As clover is rich in the elements that increase the laying, there is every reason why it should be largely used. Many successful breeders are recognizing this fact, and clover, in one form or another, is becoming a staple poultry food. Larger quantities are used each year, and where the use has once begun it is seldom discontinued. It is by making use of the materials which are often considered valueless that poultry serves a very useful purpose upon the farm. The cost of keeping is reduced, and what was once considered pure waste, becomes converted into marketable products. —Poultry World.

Clover. If you have a second crop of clover, cut it while green and tender, dry it carefully, preserving all the leaves and blossoms possible and store it up for poultry food in winter. To feed it properly, it should be cut fine and fed dry, but the best way of preparing it is to cut it in the afternoon. At night scald it in a tub or bucket by pouring boiling water over it; throw a cover (old carpet or anything) over the tub, allow it to stand all night and in the morning it will be still warm, and possesses a savory odor that will almost tempt you to eat it yourself. To every bucketful of cut hay add one quart of the following mixture: Ground corn, ground oats and bran, ten pounds; linseed meal, one pound; salt, one ounce; mix well. Feed in a trough, and give the hens all they will eat, twice a day. Each hen will walk away when she has eaten all she wishes. The bucket of dry food (scalded at night, as mentioned) will feed about thirty hens and perhaps more, and they will relish it highly. No other green food will be necessary. A gill of wheat may be scattered in the litter, so as to induce the hens to hunt and search.—Poultry News.

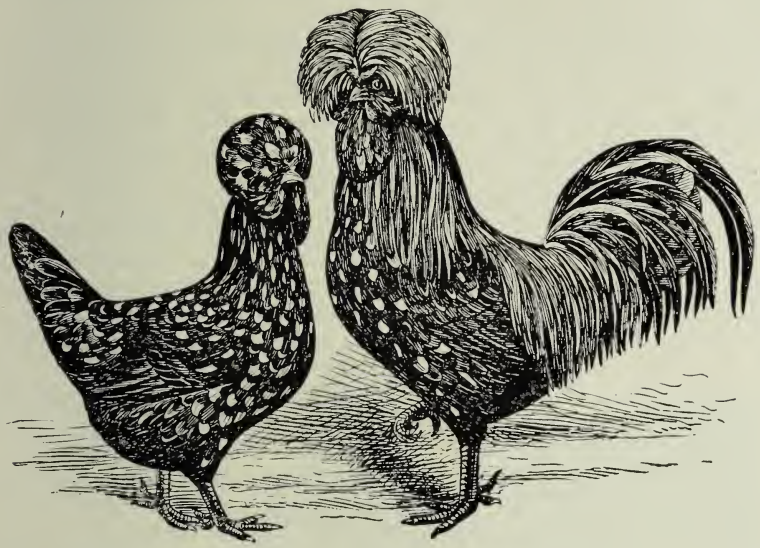
Ground Meat. The usual way of feeding ground meat is to mix it with ground grain of some kind. This is unnecessary. It should be fed as a variety, and in a way to afford a change. There should be certain meals, on special days, for giving it to the hens. For instance, give it at night on every other day in a trough, unmixed with other food, so that the hens will have nothing but the ground meat for that meal. The next morning give some other food, as corn, and the following meal may be of wheat or cut clover. The ground meat may be given plentifully if fed in this manner. Simply allow the hens to have all of it that they will eat, and they will relish it and find it beneficial. If fed on meat every meal it may cause bowel difficulty ; but given once every two days it will not be in any manner injurious, and will prove of great assistance in inducing the hens to lay during the cold weather.—Farm and Fireside.

Ensilage. One of the easiest ways of providing green and succulent food for the poultry during the winter time is to feed them ensilage, and the birds thrive so well upon it that their egg-producing capacities are increased nearly ten per cent. The hens eat the ensilage greedily, and it acts as a fair substitute for green grass and vegetables which cannot be obtained in the winter. The importance of this preserved food for poultry has not been fully appreciated by farmers. Where the ensilage is kept for cattle a little of it thrown in the poultry yard would hardly be missed, and very appreciable results will be apparent in the egg basket. The ensilage for hens can be composed of almost any green food if it is cut and packed away properly. Farmers keeping ensilage for cattle can throw a little of it to the hens, but the poultrymen must economize in filling the silo. Hens find nutriment and a stimulant in green grass, and this when stored in the silo is loved dearly by them during the winter season. Rye, when cut early enough, is cheap, and a good nutriment for the poultry. Oats, likewise, form a good crop for the silo when it is to be fed to hens, and a crop may be gathered early in the season, so that the land can be turned over to some other crop. Corn is not so valuable an ensilage for the hens as the others mentioned, for the tough stalks cannot be disposed of so readily as the grass. There is more waste to it unless cattle are also kept on the farm to eat them. The progressive poultryman will plant grass, oats or rye to fill the silo for the hens in the winter season. In the spring and summer there are



SILVER SPANGLED HAMBURG COCK.

plenty of green things for the birds, and they may even be allowed to range through the fields where the grass is growing. Their range in this way is not restricted, but the soil is growing their winter as well as their summer food.—Farmers' Review.



PAIR HOUDANS.

Cabbage. Many farmers do not realize the necessity of the fowls having green food in winter; the fowls, if running at large, help themselves in summer, and nothing is thought of it. When the frosts have killed the grass and all annual plants, and the snow covers the ground, biddy can get nothing herself to take the place of the grass and other green food she ate so freely in summer. Hang a head of cabbage in each pen, and see how rapidly it will be pecked in pieces and eaten. If hung about 18 inches above the floor, compelling the birds to jump for it, all the better; the exercise is an additional advantage gained, and exercise quickens the circulation, stimulates digestion and promotes health. Green food is to fowls much what fruit is to a human being, toning and correcting the internal organs. Cabbage is particularly valuable, because it has a large proportion of nitrogen; hence balances the carbon of the grain ration. If you want fowls to lay in winter, when eggs pay a big profit, feed them a nitrogenous rather than a carbonaceous ration; and one of the vegetables richest in nitrogen is cabbage.—Farm Poultry.

Millet. There is not much in a gill of millet seed, but there is nothing that entices hens and chicks to work more industriously over a pile of litter, such as cut straw or leaves, than a small quantity of millet seed. Do not give a full meal of the seed, but only enough to induce them to seek for it. As a food for young chicks, it is excellent. Prepare the food like this: Take equal parts of scalded bread and oat-meal with as little water as possible, to which add coarse corn-meal, about enough to make the mixture dry enough to crumble with the fingers.

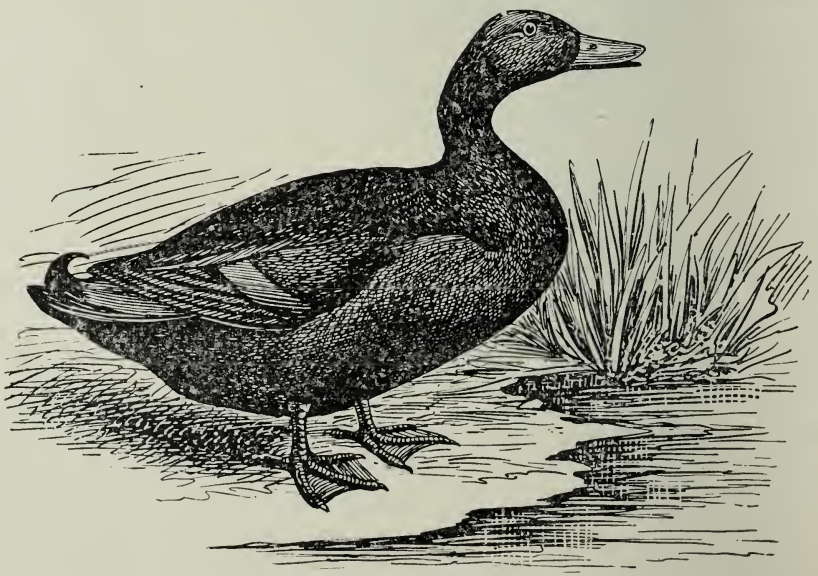
Now, after the chick is 24 hours old, feed this food to it every two or three hours until it is about three days old, and then give it millet seed, and as soon as it learns to eat the millet, leave off the other food and give it good fresh water in such a manner that it cannot climb into it. See that the chicks are warm enough to keep them from pushing up into corners and trampling each other down, and, above all, give them plenty of good, fresh air and sunshine. We have raised all the way from 100 to 800 chickens on nothing but millet seed after the second day. They will soon learn to eat and if you like to see anything eat, you will enjoy seeing a large bunch of small chickens eating millet.—Southern Planter.

Lawn Clippings.

My front yard, on which I have raised a fine sward of lawn grass, is clipped once a week during the summer. I use a carrying attachment on the lawn mower, in which the cut grass fell in one heap. The grass was dried in the shade and packed in sacks. When the snow began to fall and covered the ground, I gave my hens a portion of the grass every day, and it was relished like corn. There was an increase in the egg yield despite the cold weather. The grass being very sweet and succulent, I believe it makes a very good substitute for clover, which is not accessible on a town lot poultry yard. The hens will eat it up clean, as it is free from stems, short, and consists of white clover leaves and tender blades of other lawn grass.—Correspondent to Farm Journal.

Sunflower Seeds.

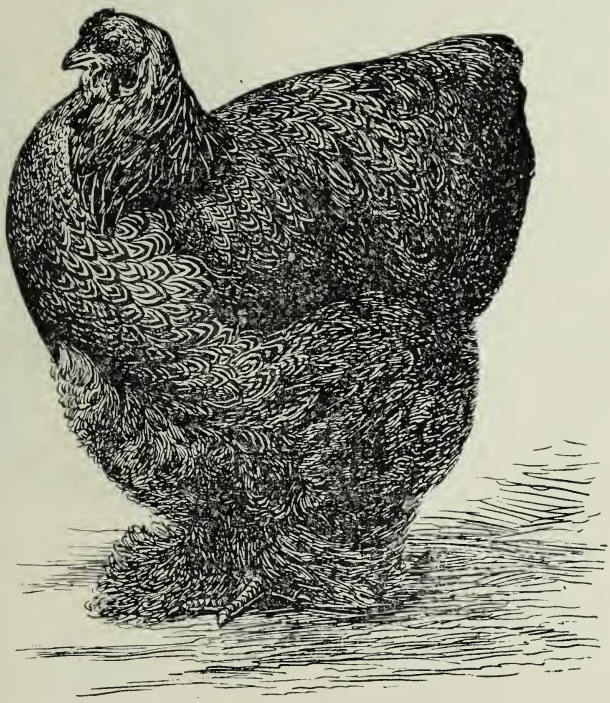
Few poultry raisers really appreciate the true worth of the sunflower. It is very easily grown and produces food of a rich and nutritious quality. When fed properly to fowls it promotes laying and produces a luster upon the plumage and otherwise benefits the bird. When fowls learn to eat the seeds they become very fond of them, and I have found them excellent mixed and fed with oats. The sunflower has other merits also which



BLACK EAST INDIAN DUCK.

claim the attention of those who would be successful poultry raisers The one which we wish now to call special attention is their use as shelter for poultry. While fowls enjoy the sunlight at the same time they require shade, to produce the best results and we know of no better and cheaper protection to suggest than the planting of sunflower groves The seed can be planted at most any time in the spring when other seed is planted—often patches are self sown—and by warm weather afford a most excellent protection. They have large leaves which shield from the sun and the stalks grow so heavy that they form a protection in winter, when thickly planted. Fowls and chicks take readily to the protection thus afforded and enjoy it hugely. The ground is generally dry under them and fowls enjoy dusting and resting under the stately and beautiful flowers—they are indeed the chickens' flowers. We would therefore in the light of these advantages advise those who can possibly do so to plant them—it will pay you to try it.—Western Rural.

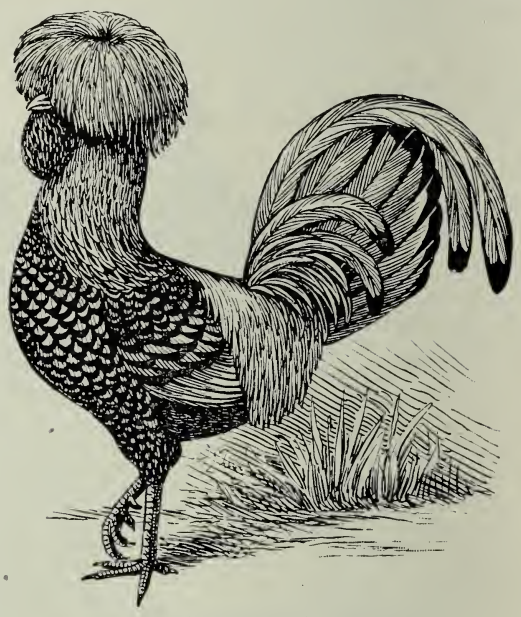
Milk. Hens should have all the milk they can readily drink; no kind of food is better adapted to egg production. Some milk mixed with bran will not fatten them · but if given freely, the vessels in which it is fed will need frequent cleansing to prevent them from becoming offensive. With milk to drink, fowls having a range will do well enough on one meal a day, as this will encourage activity in scratching and picking up what they can. This feed should be given very early in the morning, and should be steamed clover hay, with a little corn and oat chop and bran mixed with it, and a little salt added to make it more palatable. The birds will have a ravenous appetite, and they can eat all of this feed they want without injury. Sour milk may be fed to hens, but not to chicks. Fresh milk is preferable for chicks, but the sour milk may be used for mixing ground grain food. For ducklings it matters but little whether the milk is fresh or not, as they will use it in a short time. There is 12 per cent of solid matter in milk before it is skimmed, and from 6 to 8 per cent after. Fresh milk does not contain any more egg-producing material than skim milk, except carbon, which is easily



PARTRIDGE COCHIN HEN.

obtained from other sources. Give the hens all the skim milk or buttermilk they can drink. For chicks the milk should not be sour, as it may cause bowel disease, but adult fowls may drink all kinds without injury. Curds are excellent for hens, and even whey may be used in mixing food. —California Cackler.

Wheat. As an egg food wheat is highly recommended, and is unsurpassed as a basis for the grain diet. It contains more mineral matter and nitrogen than corn, and no grain food is better for pushing the growing stock ahead than wheat. When farmers are waiting for the new crop of corn, they will find it profitable to feed wheat to push the fowls and other stock ahead, for every day saved in feeding is feed saved. New wheat is especially good for fowls and every poultryman who raises wheat should place a small stack in the vicinity of the poultry house, unless the fields are close to where the fowls run. The town poultry raiser who can should buy some wheat in the bundle to feed to his hens, and let the hens thresh it out themselves. In our own experience we have always found that new wheat started the hens to laying afresh and this year we planted a little patch of wheat ourselves. As soon as it began to ripen we cut some with a scythe every day and threw into the yards, and it wasn't a week till the egg production increased. By this means we get the new wheat long before it is in market.—Colorado Fancier.

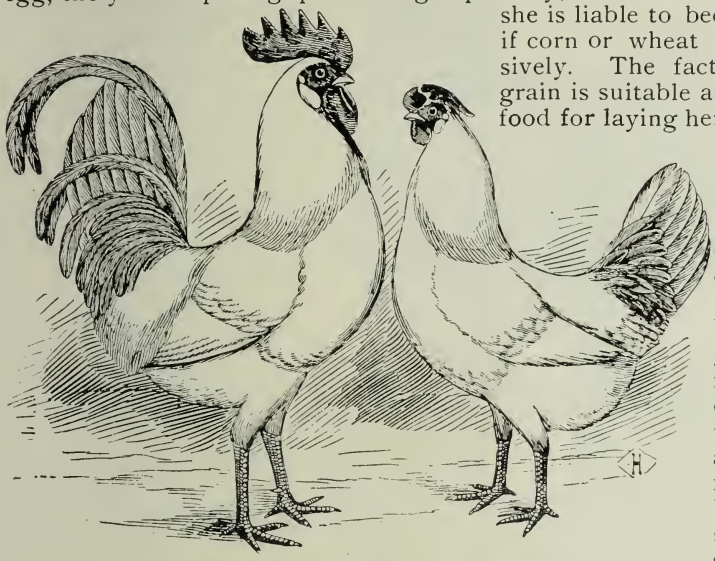


BEARDED SILVER POLISH COCK.

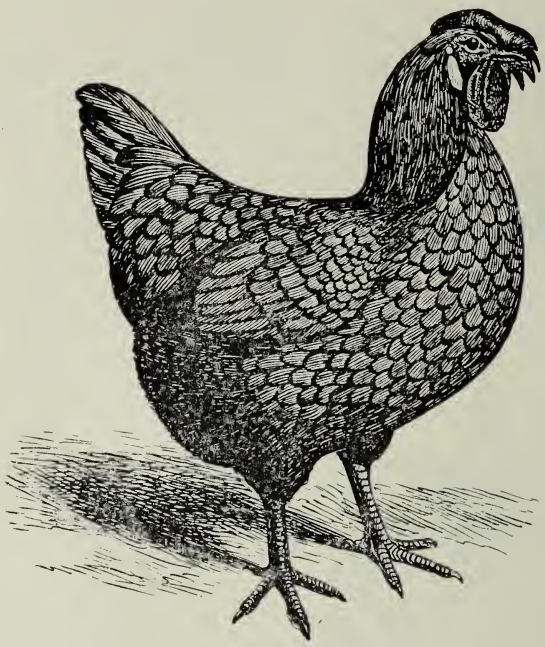
Oats. While corn and wheat is fed more frequently to fowls than oats, yet, during the warm months and as a change of the grain diet in winter, nothing is better than oats. Keep a box of oats just inside the hen house door, that the fowls may help themselves whenever disposed. We have no fear of feeding too many, for they never gorge themselves with oats as they will with corn. Sometimes they grow tired of them, though, and seem hungering for a change of food. Then remove the oat dish from before them for a few days at a time, throw them a little wheat in the morning and what corn you deem advisable just as they are going on to the roost at night, and the result of this watchfulness is a good supply of eggs. Ground oats are excellent at all times. When the hens are fat give them no grain, but whole oats and make them scratch for them.—Practical Farmer.

Corn. There is considerable discussion over the value of corn, and we may also include wheat, as food for poultry. The advocates of corn claim that as long as it can be had at a low cost it is the best

of all foods, while others contend that it has a tendency to create too much fat, and really retards egg production. The matter is one that may be discussed from several standpoints. If a hen is laying she necessarily uses a large proportion of carbonaceous material in producing the egg, the yolk requiring quite a large quantity; but if she is not laying she is liable to become too fat if corn or wheat is fed exclusively. The fact is that no grain is suitable as an exclusive food for laying hens. The production of eggs demands a variety, and corn is no exception to the rule. It is the best of all grains to feed in winter because it is heat producing and keeps the fowls warm; but it is unsuitable in summer. Feeding corn, like everything else, must be done judiciously. If fed to fowls when not really required it is expensive because it leads to no results. That it will promote egg production when given in connection with other substances is well known, and the experienced poultryman can utilize it to the best advantage if he will study the requirements of his flock. The opinion that corn is very nourishing food for fowls is so universal that no further thought is given to the matter. If any one should suggest that corn would be easier of digestion if soaked or boiled, he would likely receive the answer that corn was nothing hard to digest for birds, which swallowed stones and other hard substances without detriment. A moment's thought, however, will convince that the mill stones and the grist are different things, and feeding hard grain, although not exactly like feeding the mill stones with pebbles, bears a certain likeness to it. The trouble attendant in the preparation of food, if it is to be cooked, may indeed seem very disproportionate to the advantage to be derived from such treatment, but in reality little need be spent, as before going the rounds of the nests a little hot water may be poured over the grain, a tight cover put on the kettle and the whole placed over the stove, when by the time your rounds are completed the corn will have become steamed and mellow and have lost none of its good qualities. Remember, each hen has a certain amount of animal force to be expended every day in some direction, and the less she has to give to digesting her food the more she will have to be expended in egg producing. The advantages of the warm food in winter when much food goes toward producing animal heat to withstand the cold are twofold—from the direct action of the warmth



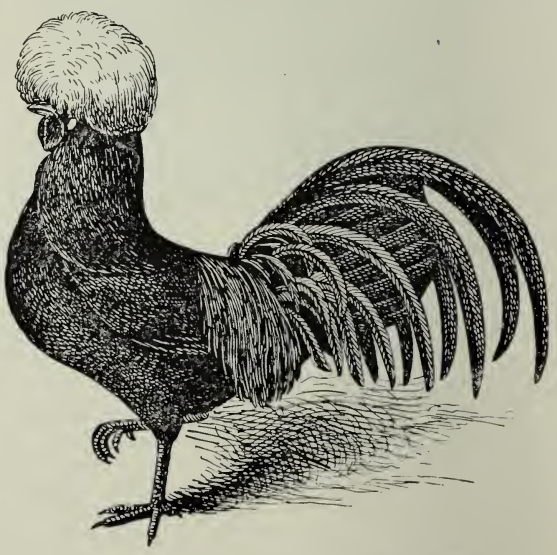
PAIR SINGLE COMB WHITE LEGHORNS.



ANDALUSIAN HEN.

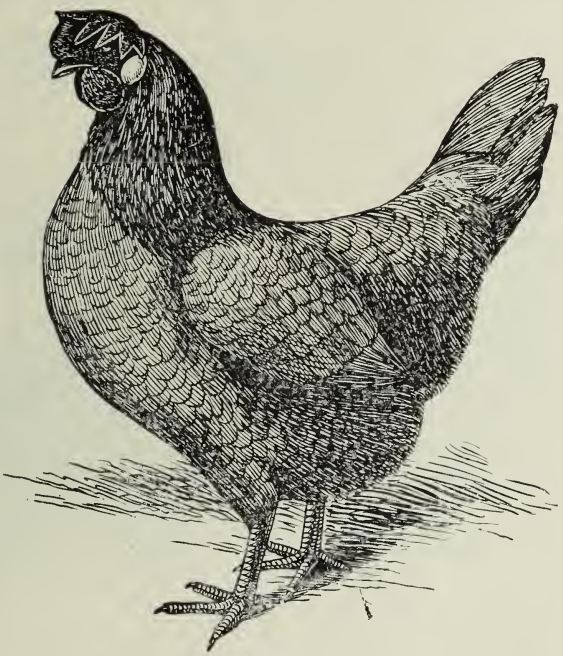
and the slower action of the food itself, to say nothing of the fact that the content produced by nourishing food will result in more eggs, for a hen thoroughly at home will lay more eggs than a discontented one. We have performed the experiment ourselves and know that feeding boiled corn does pay, and it is as the result of experience that we offer this plan to our friends.—Massachusetts Ploughman.

Bones. The value of all foods depends upon their digestibility. The green bone, containing its natural juices, is digestible, especially by birds, and when in a very fine condition, it is also digested by animals, because its particles are less dense; but the dry bone having lost its solvent agent, has become harder, its particles re-arranging closer together, and is only slowly digestible, if at all. Bear in mind that it is not the amount of food eaten that gives the best results, but the amount digested. Nothing will make a chick grow as rapidly as will green bone—in fact, the growth seems marvelous. There are several bone cutters now in the market, and they are all that is claimed for them. The object of this is to impress upon all who keep poultry the necessity and importance of utilizing the waste materials. Eggs are always cash in the market and especially in winter. Bones are more plentiful in winter than are some other valuable materials. The bone cutters are labor saving; they permit the use of valuable bone, and they pay back their cost in short time. There are



WHITE CRESTED BLACK POLISH COCK.

many things which cannot be explained, but which present themselves as facts. Take a bone, fresh from the butcher, go in your hen yard, pound the bone with a hammer on a stone, and although you may have fed your hens on dry ground bone, and have filled their troughs with grain, each will take the risk of a blow on the head with a hammer to secure a bit of fresh bone, and they will swallow pieces so large as to occasion surprise. The fresh bone serves a special purpose, for it contains the materials for the white of the egg, the yolk and the shell, all in a concentrated form, and in a partially soluble condition, while the dry bones will remain untouched—that is, as long as fresh bone is supplied. Thus we have not only egg food, but also grit for grinding the grain food in the gizzard. The cheapness of bones is another factor to be considered—many butchers give them away, or will sell them for a small sum. But the bone cutter is the agent that renders them valuable, and converts them into the most desirable of all foods. With bone and cut clover, but very little other food will be required, and hence there is not only a gain in nutritious matter, but a saving of grain also.—Poultry Keeper.



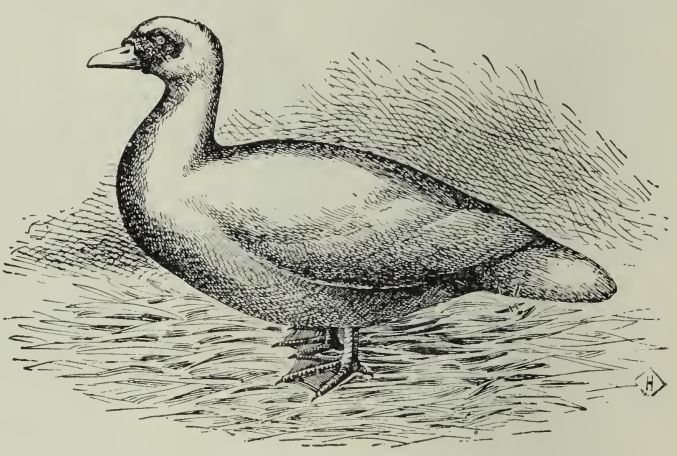
BUFF LEGHORN PULLET.

Lime. It is frequently recommended that the hens be supplied with oyster-shells, as a source from which to permit the hens to obtain the lime that forms the shell of an egg. This claim has never been supported fully, for it is well known that thousands of hens are never given anything of the kind, yet they have no difficulty in securing the needed lime. The matter depends more upon the food than upon supplying substitutes. Grain is deficient in lime and abounds in starch, hence, hens that are fed almost wholly upon grain will produce eggs with soft shells at times, but if the hens can supply themselves with grass, and have a variety, they will secure all the lime desired from the food, and the lime will be in a soluble condition. If lime is to be provided in any shape, however, there is no better source than bones, which are phosphate of lime, and also soluble after being eaten, which is doubtful in the case of oyster-shells. Bones and clover will provide hens with all the lime required, while bran, linseed-meal and middlings are also excellent in that respect. The farmer who is careful to give his hens a variety and keeps them on a range, will seldom have his hens lay eggs with soft shells. There is plenty of lime in the food. Oyster-shells serve more as gritty matter

than as a composition of the eggs, although to a certain extent they may partially assist in that respect also, but if fowls are properly fed there will be no necessity for feeding lime in any form. When hens lay soft-shell eggs, or do not lay well, it is not for want of lime, but generally because the hens are too fat, which obstructs the process of egg laying. If it is desired to feed lime, the most convenient form is in the shape of lime water, which may be used for mixing the soft food. Lime may be given, however, in any shape, if it is preferred, to place it before the hens. Old mortar (broken), bones, chalk, ground limestone, ground shells, or even plaster, may be used, but shells are sufficient. Unless the hens are in proper condition and not too fat, all the lime they may eat will not prevent soft-shell eggs, though many persons suppose when hens lay soft-shell eggs it is because lime is lacking.—American Farmer.

Linseed Meal.

Linseed meal is highly nitrogenous, and readily fattens. While it may be dangerous to poultry if fed too frequently, yet it makes an excellent food if properly given. A pound of linseed meal, fed fifty hens, twice a week, will promote in egg production and health, but if it is given more frequently it may cause bowel disease. When the fowls are costive, and the hens do not appear bright in plumage, linseed meal is better than any medicine that can be given. It is fed mixed with the soft food in the morning, the soft food being scalded. In every ton of linseed meal there are over one hundred pounds of nitrogen, equivalent to five pounds in every one hundred pounds, while cotton-seed meal is even richer. It is an excellent substitute for grain, as the meal can be given every other day, alternating with bran and ground oats.—New Hampshire Mirror.

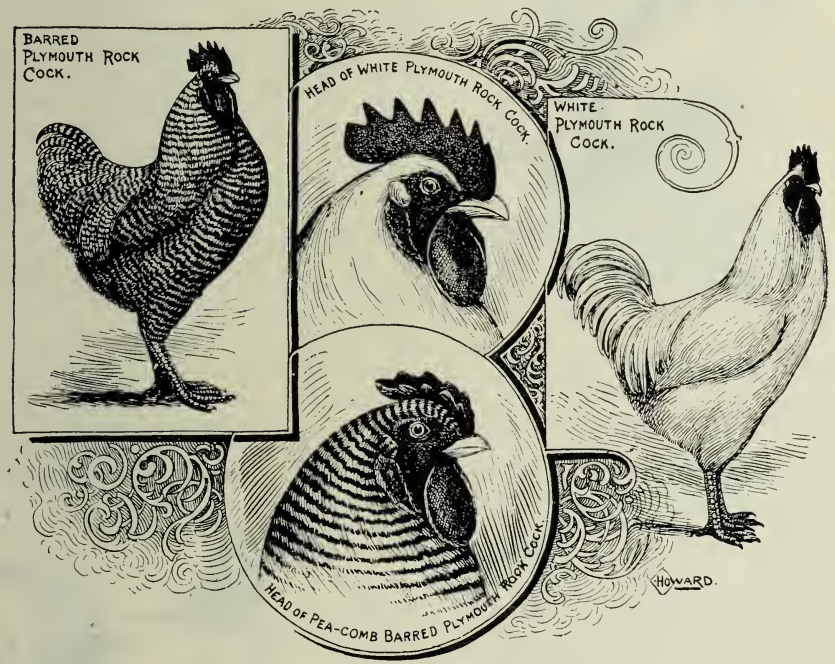


MUSCOVY DRAKE.

A. F. Hunter, Massachusetts.

Five mornings in the week we feed a mash made up of about a third cooked vegetables washed fine, an equal amount of boiling water, a heaping teaspoonful of salt to a bucketful, a heaping teaspoonful of cayenne pepper every other day, alternating with powdered charcoal; into this is stirred a mixed meal until the mash is as stiff as a strong arm can make it. The mixed meal consists of one part each corn meal, fine middlings, bran, ground oats and animal meal. The foundation of the mash is the cooked vegetables, which may be refuse potatoes, beets, carrots, turnips, onions, and potato, squash and apple parings, well cooked. Feed this mash in troughs large enough for all fowls in the

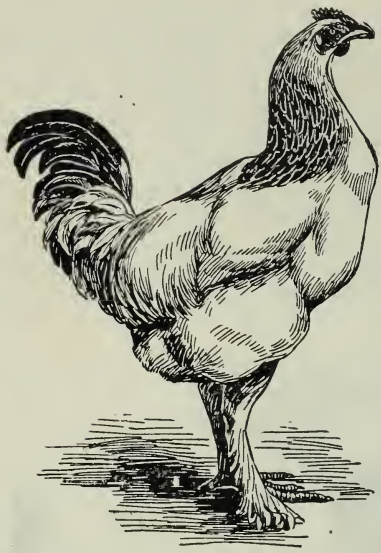
pen to get about it at one time. When cold weather approaches, exercise must be stimulated, and we cover the pen floors three or four inches deep with chopped meadow hay or chipped straw, into which the grain is scattered. Whole wheat is the best grain for fowls and whole barley is the next best. We make barley the noonday feed five days in the week, and wheat the night feed five or six days in the week. Monday we feed oats (or barley), wheat, whole corn; Tuesday we feed mash, barley, wheat; Wednesday we feed mash, cut bone, wheat; Thursday we feed oats, barley, wheat (or corn); Friday we feed mash, barley; Saturday we feed mash, cut bone, wheat; Sunday we feed mash, barley, wheat. Ground oyster shells are always accessible, and fresh water replenished three times a day, (warm in winter) and the water pans carefully rinsed every day completes the table.



BARRED AND WHITE PLYMOUTH ROCK COCKS.

Michael K. Boyer, Massachusetts.

If you want eggs, you must give such material as makes eggs, and if you want to produce stock for market you will have to adopt an entirely different plan. As I raise both eggs and chickens for market, I will give you the bill of fare I adopt. For eggs, each morning I make a mash of one-half bran and the other half of equal parts of ground corn and oats and middlings. All the vegetable and table scraps I can gather, I cook and add to this ground grain. I scald the mixture and work it into a crumbly mess. Once a week I add a quart of meal scraps to a pail of the mixture; ground bone is also given once a week in the soft feed. I feed the mixture while hot. When we have it to spare, I boil skim milk, and scald the ground grain with that. Milk is a complete egg food and it pays to give a supply of it to the

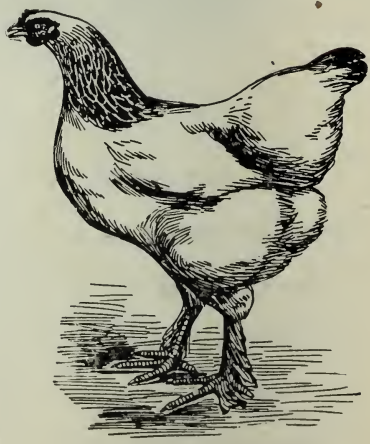


LIGHT BRAHMA COCKEREL.
(25 Years Ago).

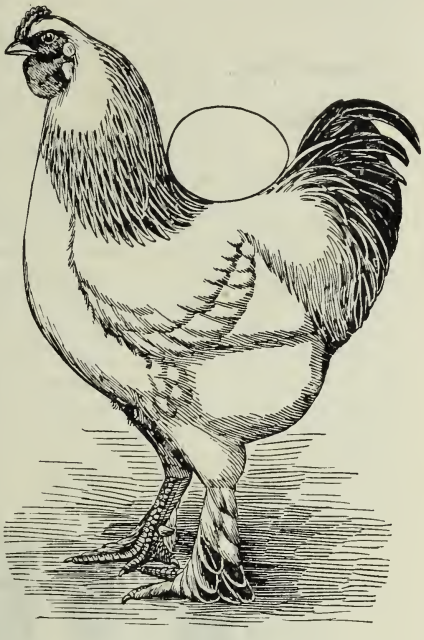
hens. This mash is fed the entire year. At noon, especially during the winter, I scatter wheat among a lot of litter in the scratching pens, which induces the fowls to exercise, which not only keeps them in good health, but increases egg production. At night I give them oats,also scattered among scratching material. During cold weather in the winter, corn is given at night. Cut bone, oyster shells and scrap grit are constantly before the fowls. Fresh water is given several times a day. Outside the runs a patch of rye is sown in the fall, which furnishes excellent green food for the hens during good weather in the winter, when the snow is off the ground, and in spring. In addition to this, rye and cabbage heads are hung in the henhouse to allow the fowls to pick them at will. This system of feeding gives us a good egg supply the entire year, especially in winter, when the price of eggs is best. The rye feed gives a splendid color to the egg yolk, not only making a more attractive colored yolk, but one of richer taste.

W. F. Bassler,
New York.

Two things I study to do—keep the fowls healthy and to mate them especially for eggs. While I like to see fine, well-marked birds, I will sacrifice beauty any time for a good layer; but as a general thing I do not have to do so. Early in the morning I scatter a couple of handfuls of grain in the chaff, that the hens may commence the day with work. An hour or so later I give them a hot mash consisting of a quantity of cut clover boiled in milk or water. To this is added cold, boiled potatoes chopped up fine, and ground grain, consisting of two parts wheat, one part oats and one part corn. By putting the potatoes and ground grain into the kettle of hot clover, the mixture is cooled just right to feed. The cooked vegetables are given twice a week. About two hours before dark they have all the grain they will eat up clean. I think very much of the clover, and my hens have growing clover in summer. About twice a week I feed ground meat and bones. For the grain food I use a mixture of one bushel of wheat, one-half bushel of oats and one-half bushel of barley oftener than any other. It's not always the same, varying according to the season.



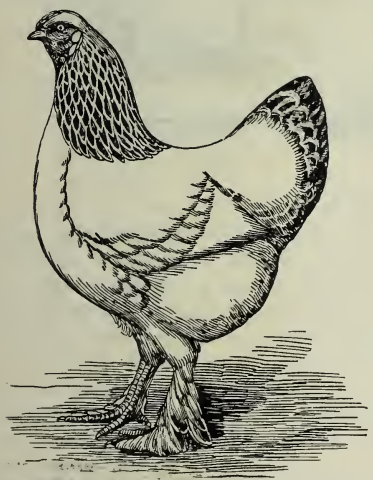
LIGHT BRAHMA PULLET.
(25 Years Ago).



IDEAL LIGHT BRAHMA COCK.

Dr. Gillup, California.

My morning feed for twenty-three laying hens and thirty-seven chickens is two quarts of wheat bran, in which I mix two measures of seed meal and a teaspoonful of salt. Pour in boiling water and mix until all is moistened thoroughly, but not sloppy—rather dry if anything. Now, mind, this is the morning feed for old and young, fed early and hot. The next feed after breakfast is green barley, cut up so all eat it readily. For this purpose I sowed some very early and cut it over, and it springs right up again, so we cut the ground over three or four times. Then we have a later sowed lot to come on after the first patch gives out. Our young chicks are kept in a yard instead of a coop. In some parts of each yard I leave every other evening after the chicks and chickens have gone to bed, some whole wheat about six inches deep, and keep this ground quite moist, so the wheat will be quite softened up before the old hen gets to scratching in the morning. Don't bury this wheat all in a pile, but scatter it so they can only get a few kernels at a time. Now, if you have fixed this just right and just enough buried wheat, you need not feed them again for a whole and sometimes two whole days, except their morning mash and the cut green feed two and three times per day. Just as it happens I occasionally feed a little cracked wheat and sometimes a little corn. Be extra careful to never overfeed. Young chicks just hatched I feed for the first two or three days on dry bread crumbs. My laying hens get a feed of grain at noon and another at night, always fed where they have to scratch for it—either in litter of some kind or on a light piece of ground kept forked up loose. I mix cracked corn and wheat in about the proportion of three sacks of wheat to one of corn. Occasionally feed Egyptian corn and occasionally cracked barley. Now count your hens and measure out one heaping teaspoonful of grain to each hen for their noon and evening feed. I feed the evening feed of grain at 4 or 4:30 o'clock, then just before they go to roost give a good feed of the green barley, or green corn answers the same purpose. Cut up so they can eat it readily. I cut all my green

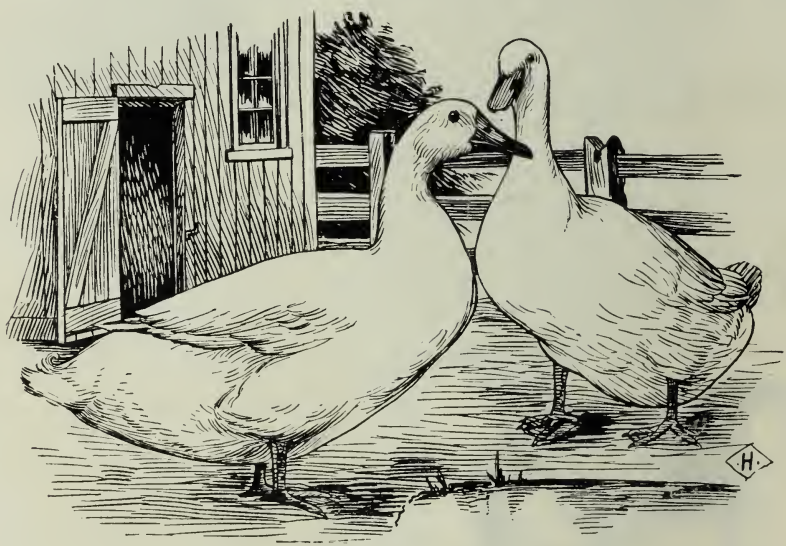


IDEAL LIGHT BRAHMA PULLET.

feed with my jack-knife. It is very easily done when you know how.

Fannie Field,
Illinois.

To make hens lay we must have: First, warm and dry houses for them to roost in; second, alongside each pen there must be a shed for them to occupy during bad weather; third, give corn only at the evening meal during cold weather to impart a warmth to the body; fourth, bury all grain among chaff, leaves or other litter or throw in scratching pens to induce exercise; fifth, mashes made from ground grain, fed scalded or dry, to which is added two or three times a week ground meat scraps, must be given every morning; sixth, there must be a liberal supply of green food, such as cabbage; seventh, fresh water must be given daily; eighth, sharp grit and cracked oyster shells must be constantly within reach; ninth, there must be perfect cleanliness. Hens don't lay when they are lousy. They can't lay when they have not the proper material with which to make the eggs. They won't lay when cold. A lazy hen is a misery to herself. A hen that is continually scratching and keeping busy does not mind the cold and in consequence is the one which lays the eggs. Hens in crowded quarters breed sickness and sick hens are unable to lay. Fowls must be in good condition to yield a profit.



PAIR PEKIN DUCKS.

By the Orange
Judd Farmer.

To get the best results from the food, give the warm breakfast in the morning, then soon afterward scatter a little grain in the litter on the floor; give grain at noon and once between noon and supper time. Just before the fowls go to roost give them a full supper of grain consisting of corn about two-thirds of the time throughout the winter. I know that many poultry writers object to the use of corn, but all the same whole corn is the very best food which can be given to fowls at night during cold weather. By cold weather I mean when the mercury is in the neighborhood of zero. Corn is a heat producing grain, and when fed whole digests slowly, consequently is just the thing to "stand

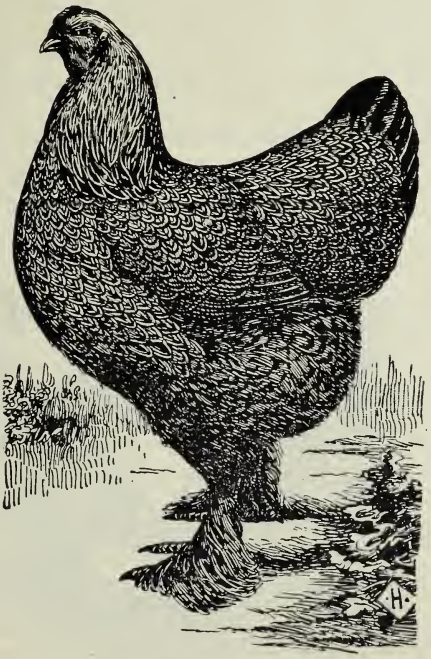
by," and keeps the fowls comfortable through the long, cold nights. But don't feed that corn, or any other grain, cold. Warm it thoroughly and the hens will feel much more comfortable and thankful than they would with their crops full of cold grain. Let them eat all they want, for if they have had the scattered grain through the day, and green food where they could help themselves, there will not be the slightest danger of their eating too much, even of corn, for they will come to their supper with empty crops. When they are through eating, remove the grain which remains; for in the morning they have their cooked mash.

Prof. A. G. Gilbert, Ottawa Experimental Station.

A hot morning ration may be fed during the winter composed as follows: Bran, three pounds, shorts, three pounds, and ground meal two pounds. Clover hay steamed and mixed in liberal quantity, a small quantity of salt and about three handfuls of coarse sand and fine ground oyster shells mixed. The whole to be mixed while boiling. Boiled potatoes and turnips may be substituted for the clover hay, and as a variety in diet is beneficial, at noon feed oats, and for the evening feed use whole wheat. Vegetables, such as cabbage, carrots and turnips, should be in reach of the fowls always.

Myron S. Perkins, Massachusetts.

As far as feeding poultry is concerned the most common trouble is a lack of variety in diet. It should always be remembered that fowls are omnivorous in their habits; their natural food comprises the whole three kingdoms into which matter is divided, viz., the animal, vegetable and mineral. If any one or two of these is supplied and the third is lacking, the ration is unbalanced, and consequently not calculated to develop a perfectly healthful organism. When fowls are confined in houses or yards the various grains such as corn, wheat and oats, form too large a proportion of the bill of fare in many cases. Green vegetables and meat should be supplied in much larger quantities than they are ordinarily given. Have a cabbage or beet in the fowl house at all times, that the fowls may help themselves as they wish. Ground beef scraps, fresh raw meat and finely ground butchers' bones contain much nutriment, and are excellent to stimulate egg production. Then oyster shells must be given to furnish lime, and gravel, pounded glass and crockery to aid in reducing the food. Furthermore, in feeding poultry it must be borne in mind that the feed is according to the object to be gained. Is it eggs or flesh?



DARK BRAHMA HEN.

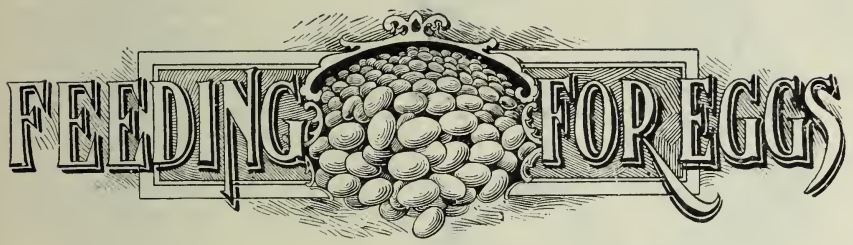
Are they young or old birds? Different cases require the following of totally different methods. For eggs we want such foods as bran, shorts, cotton seed, gluten and linseed meals, peas and clover. For the production of flesh feed corn, rye, buckwheat and oily foods. There is no definite iron-clad rule to be laid down upon this subject. It is necessary to determine what is desired always, and then act accordingly.

L. F. Scott, Connecticut.

It is absolutely necessary for hens to have meat during the winter if we expect a return in eggs. Scraps of meat from the market are good, either raw or boiled, and when these are not obtainable take a piece of salt pork from the barrel and nail it up on the side of the hen house within their reach, and see how greedily they will demolish all but the skin. When I have an old farrow cow in the fall that is not worth wintering and is poor, I have her butchered, cut up and salted, just as if we were to eat it; this we boil all winter, a little at a time, and feed it to the hogs and hens (it needs no cutting). When I open the hen-house door with a pail of this meat, they smell it and will begin to sing, sometimes flying upon me to get hold of the meat. But this is only one of the cares for hens; they need something green, such as cabbage, boiled potatoes, new potatoes and whole apples to pick. I take rowen hay, run it twice through the hay cutter, pour boiling water on it, then pour out the water for drink, and it will astonish one to see how much of this green hay they will eat. Then every year or two I get a barrel of sea shells, keep them by the hens all the time, and for gravel, I get a flint stone and burn it until it will crumble, and then run it through a bone mill; this will make sharp material to grind their food. All these things are for them when confined by snow or cold. Then a large dust bath is necessary, but in open weather let them run out, if not too cold. I never allow their combs to be frozen. My hens are every one last summer pullets, and they have laid incessantly from October to the present time, March 15. I say nothing about grain feed, only that green corn as soon as it can be shelled will make pullets lay best.



WHITE WYANDOTTES.



Feeding is a subject which requires constant thought and care from the practical breeder to secure the best results. The conversion of grain and other kind of poultry foods into eggs and thence into meat necessitates a well regulated system of feeding. Imprudent use of the grain foods retards the development of the properties that the eggs yield, and weakens the natural condition of the fowl.

While grain may be considered the natural food of fowls, it has been shown that grass and worms are just as essential. A fowl in the state of nature lives under entirely different conditions from one in confinement, and is therefore dependent upon the breeder as the master of the latter conditions. In its limited space the fowl must consume that which is given it. The wild fowl gathers its food,grain by grain, and its searching, roving tendency does much to induce good digestion; the bird must work for what it finds, so that all its functions are kept vigorous by exercise.

A fowl in confinement needs a change of diet regularly to keep its health, and it is only when in a healthy condition that the egg supply will be at its highest. Many suppose that hens should lay merely if fed with a single kind of food, without considering the essentials for egg production. By a variety of foods the elements that are contained in the white, yolk and shell are produced. These are nitrogen, carbon and water, with certain proportions of mineral matter. Nitrogen is an elementary gas which forms about four-fifths of the atmosphere, the remaining fifth being oxygen. Now in food, nitrogen is albumen,fibrine, flesh-forming, as the white of an egg. Carbon is oil, fat, starch, sugar, etc.—carbonaceous materials. The starch of feeding stuffs is known as carbo-hydrate, the hydrate signifying water in a crystaline state. During digestion all starch matter is more or less converted into sugar, and form sugar into other forms, including fat, which exists in oil. The mineral matter consists of lime, soda, potash, magnesia, sulphur, etc., which is found by reducing the food to ash, permitting the nitrogen and carbon to escape in a gaseous state, though a portion of the mineral matter is sometimes left in the shape of carbonates and phosphates.

Phosphoric acid unites with minerals and alkalies. When united with lime we have phosphate of lime, or bone; when united with soda, we have phosphate of soda. When carbonic acid unites with lime the result is carbonate of lime, as oyster shells, chalk, marble, limestone, eggshell, etc.

The difference between a bone and an oyster shell in that while both have lime as a base, phosphoric acid and carbonic acid form each a separate combination under different conditions.



WHITE LEGHORN COCK.

In the composition of the egg, which is divided into the white, yolk and shell, we find that water, fat, albumen, sugar and mineral matter are all in the white. Let us take a hundred parts and divide them. The result will be: Water, about 84 per cent; albumen, about 12½ per cent; mineral matter, about 1 per cent; sugar, etc., about 2½ per cent.

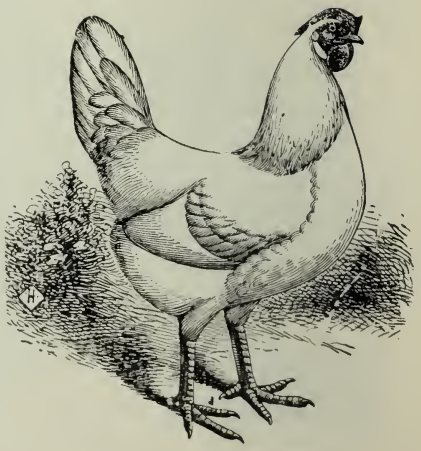
Grains or any other quantity to the number of 100 parts contain only 16 parts of solid matter, but this would make 96 grains of solid matter for each egg, which contains 600 grains of white or 75 grains of albumen. Water to the extent of 500 grains is also contained in the white:

The yolk is composed as follows, taking 100 parts: Water, about 52 per cent; oil and fat, about 45 per cent; albuminoids, about 1 per cent; coloring matter, about 1 per cent; mineral matter, about 1 per cent.

The yolk contains 300 grains, more than half of which is water; nearly half is fat, and a portion of it is albuminous. Let us put the white and the yolk together; we then have, deducting 100 grains for shell, 900 grains, thus: Water, 650 grains; albuminoids, 80 grains; oil, fat, etc., 135 grains; mineral matter, 9 grains; sugar, coloring matter, etc., 26 grains.

About fifty grains of salts of lime, or about 20 grains of pure uncombined lime, which is calcium oxide, and the remainder carbonic acid, water in crystalization, etc., form the shell. But some of the mineral matter in the white and yolk is also lime, or the chick could not be produced for lack of bone. It must be borne in mind that the mineral matter is made up of sulphur, potash, magnesia, soda derived from salt, phosphate of lime, etc. One must know what to put in an egg before it is complete, and next how to get the materials for that purpose.

Having examined the egg and found the ingredients, we should use the foods richest in these. The first



WHITE LEGHORN HEN.

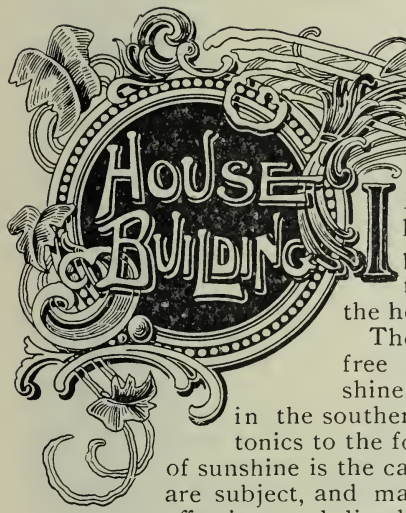
thing to be considered is the foods which contain the most lime for the shell. White clover hay is the richest in lime, containing in 1,000 pounds about 24 pounds of soluble lime. Red clover hay contains about 28 pounds of lime to the 1,000 pounds. Grain food is the poorest in lime substances, containing only about one pound of lime to the 1,000 pounds. This is clear evidence of the fact that hens lay soft shelled eggs when fed regularly on grain diet. Tops of turnips, beets and carrots contain a liberal amount of lime.

Avoid too much carbonaceous matter. The birds should be caused to exercise, as the carbon is thus converted into heat and given off from the body; quick breathing throws off the carbonic acid gas, and a portion of the carbon is used to provide warmth for the body.

In feeding endeavor to equalize the food and provide the fowls with foods in proportion for the object desired. The foods that are intended for fattening purposes should never be given to laying stock; flesh forming, heat producing foods and foods rich in mineral matter, should be balanced to produce the results desired, and should not be fed indiscriminately. The table appended is of value for reference, careful study of it will add materially in feeding for desired results:

Reference Table.		Flesh.	Heat.	Dry Matter.	Mineral Matter.
Green Foods.	Beet leaves	2.2	5.0	10.7	2.1
	Cabbage	2.5	7.8	14.3	1.4
	Clover, red	3.6	9.0	19.8	1.5
	Clover, white	4.0	8.9	19.8	1.5
	Green rye	3.3	11.0	24.0	1.8
	Green oats	2.4	7.6	18.2	3.1
	Timothy	2.7	15.1	31.0	2.1
	Turnip leaves	2.1	5.6	11.6	2.3
Grains and Seeds.	Cotton seed meal	41.2	32.0	80.	7.1
	Linseed meal	28.1	42.3	78.	6.4
	Beans	25.5	46.5	86.	3.2
	Peas	22.4	54.5	86.	2.7
	Middlings	18.0	59.1	87.	2.6
	Bran	14.5	59.6	87.	6.0
	Buckwheat	11.2	64.3	88.	2.9
	Barley	10.6	65.7	86.	2.6
	Corn	10.4	72.6	89.	1.9
	Oats	12.9	59.8	87.	3.1
	Wheat	11.3	69.6	86.	1.8
	Rye	11.4	67.8	85.	1.8
Dry Grass Foods.	Red clover hay	11.0	35.0	83.3	1.5
	Meadow hay	7.3	45.2	85.7	6.0
	Timothy	6.2	44.7	85.7	2.1
	Salt marsh hay	6.1	41.6	89.3	7.6
Root Crops.	Carrots	1.0	9.3	12.9	0.9
	Parsnips	1.6	8.2	11.7	0.7
	Potatoes	1.8	20.6	24.2	1.0
	Turnips	1.0	5.8	8.9	0.8
	Sweet potatoes	0.9	26.3	30.3	1.0


GOLDEN
PHEASANTS.



IN THE construction of the poultry house be economical; avoid lavish display and ornamentation, and use methods that will be of advantage to the health and comfort of the fowls.

The house should be plain, substantial, free from dampness and draughts. Sunshine should be provided for by windows in the southern exposure; light and sunshine are tonics to the fowls and will prove beneficial. Lack of sunshine is the cause of many diseases to which poultry are subject, and many cases of colds, catarrh, rheumatic affections and diarrhœas are traceable to dark houses.

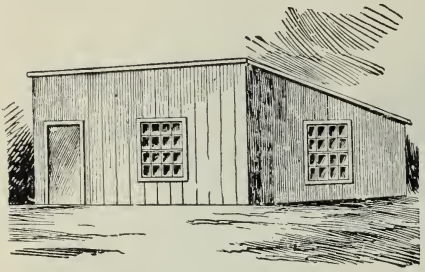
During warm weather provide ample shade in the runs for shelter. Trees and bushes are natural shade, but when trees are not accessible, small sheds may be attached to the houses or large boxes scattered promiscuously will give shade and shelter from the storms. Poultry like fresh air, out-door exercise, and shady nooks to scratch in; it is akin to their nature and the provision of shade and out-door shelter will enable them to enjoy these things to their own satisfaction and benefit.

Ventilation is needed. That is, it should be provided in a way to be of service to the fowls, and not as some use it. Poor ventilation, or too much ventilation, has caused many deaths. Avoid the use of ventilators which cause a draught on the bird while on the roost. If ventilation must be used, then a pipe at the end of the house farthest from the roosting place is best. This pipe should be about 12 inches from the floor and should have an exit in the roof. Do not use overhead ventilation of windows at the sides of the house as a means for providing fresh air; these methods will cause draughts and cannot fail to play havoc among the flock.

A good method for providing ventilation, and it is perhaps the safest and best, is to build the house to accommodate only the number of fowls to be kept without crowding. If the house is well lighted it will need no other ventilation than is naturally provided. Build a house to suit the flock, or keep a flock to suit the house. No other ventilation will then be needed other than the pure air which is in the house.

Build the house in a dry, well drained location, free from dampness. Have the floors raised from the ground and cover them with dry earth or sand. Keep clean and have everything in a neat, trim state. Do not be negligent in the care of the house. Be active and watchful and attentive to duty.

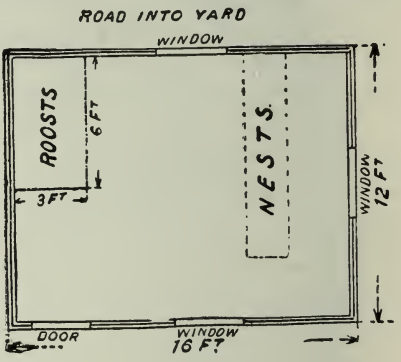
A Cheap House. The house is large enough for about 25 hens. It is 16 feet long and 13 feet wide; 11 feet high in front and six in the back. The roosts are in the northeast corner,



A CHEAP HOUSE.

placed over a platform, which is six feet long and three feet wide. The platform is placed on 2x4 poles in front, which are sharpened and driven into the ground so as to be 34 inches high.

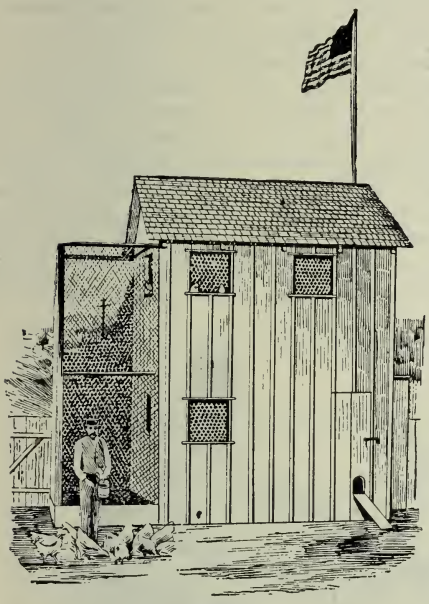
This leaves room in the west end to set a barrel under to scrape the droppings into. The roosts are set about eight inches from the edges of the platform, and there are two running lengthwise, which gives room for 25 hens. The north and east edge of the platform is nailed into cleats. The roosts are 16 inches high. The nests are built by laying a box eight feet long on stones near the ground, the box being divided into four compartments each 12 inches deep. The box lays on the side, and there is a narrow board nailed across the front near the ground, and has doors of laths to fill space above. This is for hens with chicks. The chicks can run out into the south room, which is four feet wide and eight feet long. Above this box (the top to serve for bottom of one row of nests) is built a double row of nests, six on each side, with a sliding partition between each nest. There is a standard set up at centre of each end of box; across the top of these is a piece of 2x4 timber nailed the entire length of the box. Above this to the floor overhead there is a wire partition. On each side of the 2x4 timber there is a narrow board nailed on to fasten the hinges of covers. In front of the nest there is a board 12 inches wide cut so that the hens can enter the nests. The covers of the nests are half-inch boards, which are put on slanting, resting on the edge of the board in front, so there is no chance for the hens to roost on and foul the nests.



GROUND PLAN.

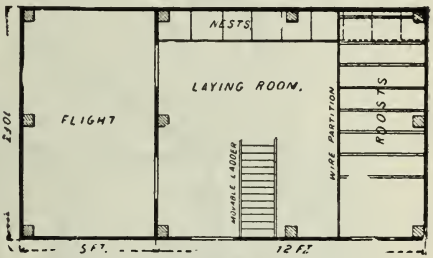
The feed box is six feet long, nine inches high in front, and fourteen inches back, with slanting top like the nests, with cover four inches wide on hinges. There are slats both in front and back, so the hens can eat from either side. This box set about half its width under the north side of the nests, so there is room for the hens on both sides.

A Double House. This house is designed to accommodate about thirty fowls, but can be made on the same plan to any size required by the builder. The loft is an addition which will meet the requirements of all who wish to keep pigeons to a good advantage without occupying the ground space of the fowls. This addition can be built on any shed or small lot, and the lower story can be utilized in many ways to suit the builder, if he does not intend to keep fowls. The plans may be varied in many ways, but for a combined poultry house and pigeon loft, every precaution has been taken to make it complete in all particulars.

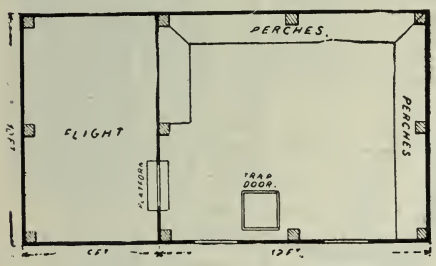


A DOUBLE HOUSE.

joints and cracks covered with three inch strips. There are five half windows, and two doors, the sash and all doors open on the outside. The shingled roof and flagstaff complete the ornamentation of the exterior, except the flight, which is covered with one inch mesh.

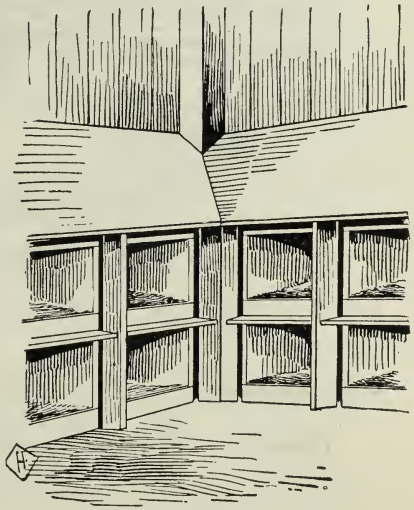


GROUND PLAN OF POULTRY HOUSE.



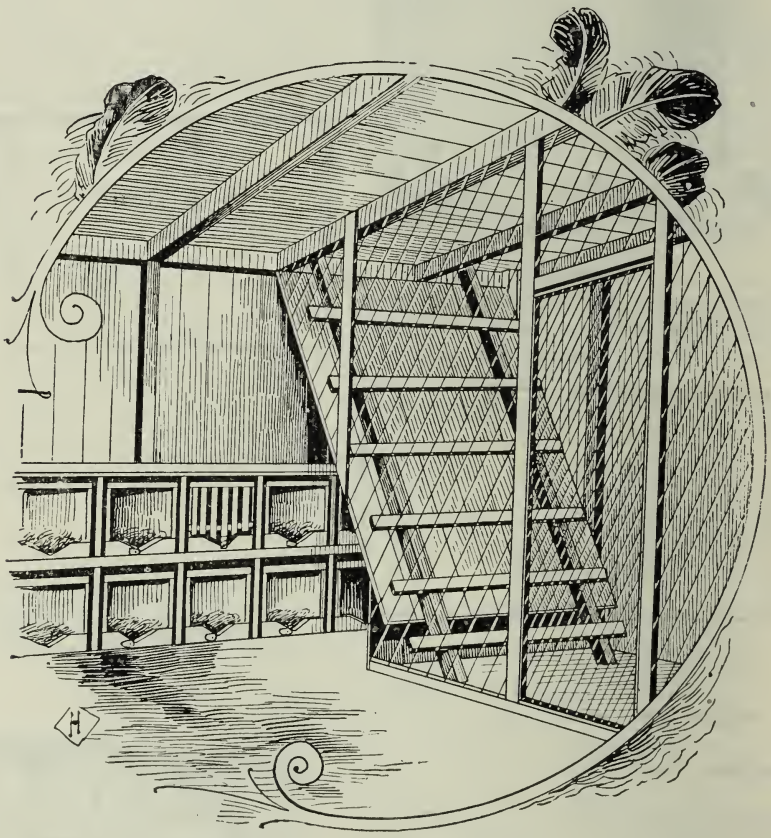
GROUND PLAN OF PIGEON LOFT.

House for Laying Hens. A substantial house for laying hens is shown in Figure. In early spring, chilly days and nights retard the inclination of the hens to lay as steadily as they will in warm, nice quarters. This building is one which should suit the farmer, and the cost is much less than a more elaborate house. This building is 50 feet long, 21 feet wide, 10 feet high in its lowest point, and 8 feet where sash is shown. The pens are 9x10



NESTS FOR PIGEON LOFT.

feet with nests for the layers on either side of the hallway, which extends the entire length of the building, each pen being connected by a door with the hall. This house can easily accommodate 100 hens, but it would be better to put in a less number and allow them ample space. The floor is raised three inches from the ground to shut out dampness, and the dry earth and coarse sand are the only covering it has. The building is provided with a stove to keep it free from dampness. This is also used to heat the food prepared in a caldron or boiler before feeding the same to the flock in the morning. A stove is a great convenience where a large number of fowls are kept. The ventilators above the windows are opened for one hour in the middle of the day and are closed again to keep out the cold. In the ground plan. P are the pens; N are the nests.

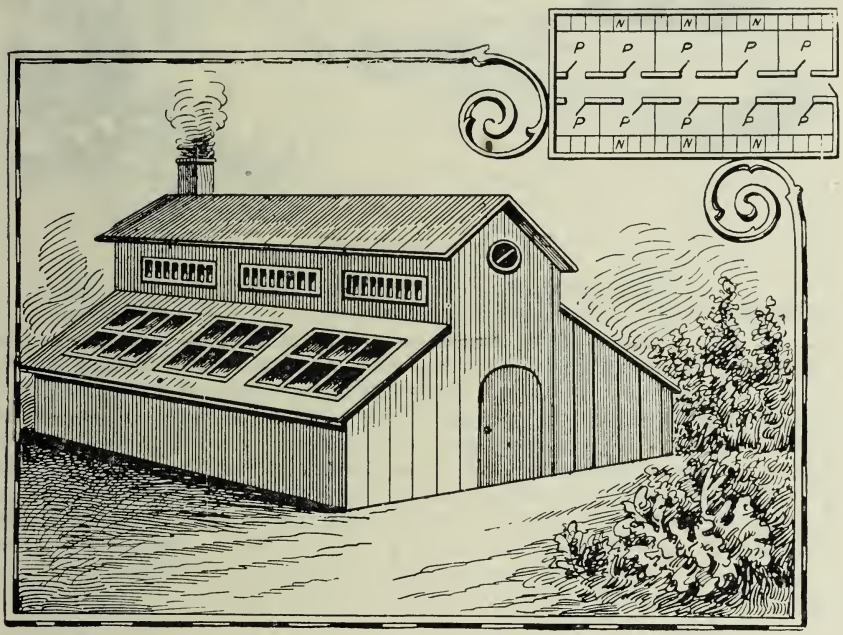


INTERIOR OF DOUBLE HOUSE.

Well Arranged House.

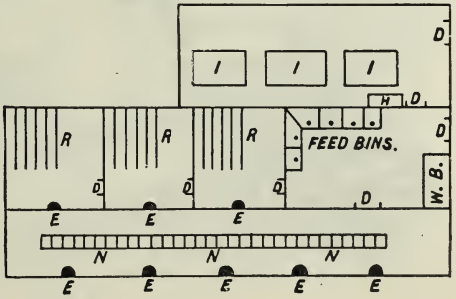
This building shows a structure somewhat different in its arrangement from a great many buildings for poultry. It is practically three separate buildings in one. The first is entirely for hens; that is, nothing but nesting places are in this part. It is 30 feet long by 10 feet wide, and seven feet high, making ample accommodations for from 40 to

60 hens. Opening from the yard permit them the freedom of the yard when they desire to go out into it. The second part of the structure is given entirely to feeding quarters and roosting places. The entrance from the roosting rooms from the laying quarters is shown in Figure, the ground plan indicated by the letter E. This enables you to divide your flock at night, avoiding too much crowding on the roosts, and the doors leading to each roosting section can be thrown open, and they can either pass through there or go directly from the laying house through the door at the right end of the laying quarters. The doors are indicated by letter D, the roosts by R, and in the feeding quarters the feed bin and work bench occupy a part of the room.



HOUSE FOR LAYING HENS.

The building is 30 feet long by 18 feet wide by 8 feet high. A stairs or ladder lead up to a large room in which pigeons may be kept. Two windows on the front give light to the lower floor, and the mansard cupola on the roof afford light to the upper room. The last building is arranged for incubators, I and the brooders as well as the heater to cook feed, and keep the place warm in cold weather. This part is convenient and necessary and should always occupy a separate part of the poultry house. This section is just 15 by 18 feet, and is 7 feet high, with one window and two doors, one leading to the feeding quarters, and the others to the outside.



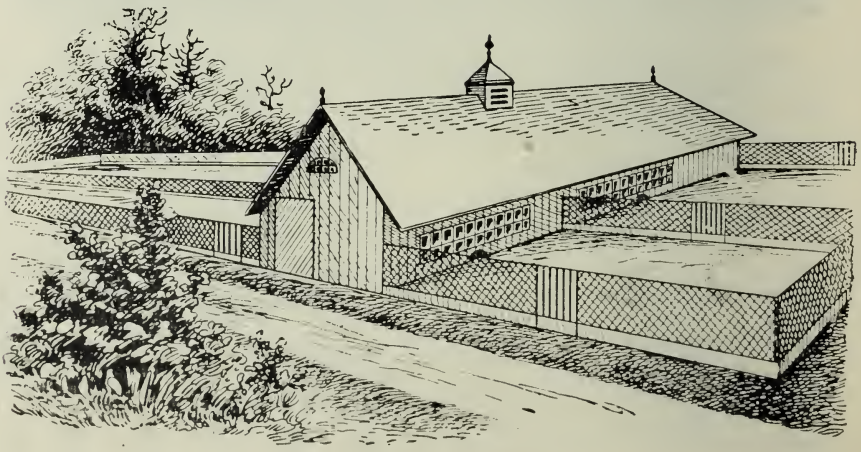
GROUND PLAN OF WELL ARRANGED HOUSE.



WELL ARRANGED HOUSE.

A Roomy House.

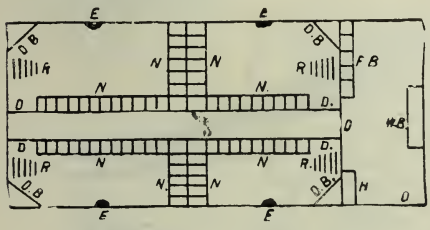
Although there are many buildings that can be made suitable for keeping a flock of fowls, yet some prefer to see a plan or two, in order that a proper selection as regards arrangements be afforded when they contemplate building a house for their flocks. A house that is roomy and comfortable in winter weather should be just as comfortable in summer. They do not require so much shelter then as in winter; very often they prefer to roost outside on trees and fences where freedom from bad odors, often found in poultry building, is avoided, and they are none the worse for it, becoming hardier and more able to withstand the winter when it comes. Many farmers through the northern states give very little care to their fowls in the warm weather; they seem to do well, costing comparatively nothing to feed them, all being profitable to their owners.



A ROOMY HOUSE.

The illustration shows a very cosy laying house to accommodate from 100 to 200 hens. It is built plainly, consequently cheaply, affording, however, as comfortable quarters as houses costing far more. It is 90 feet long, 44 feet wide, and 15 feet high. This is a good size and suitable for a flock of layers, yet you may change the proportions to suit your own ideas to accommodate just the number of fowls you desire to keep about your place.

The ground plan shows the interior arrangements. A hallway separates the four large pens, each of which is 35x20 feet. The letter D indicates all doors in and about the building, N the nest boxes, which will be noticed have been amply supplied in each pen. The nests are fastened in sets of three by hooks, and can be removed quickly and cleaned without any trouble. R, the roots, each pen being well supplied with low comfortable roots. D B, the dust box; F B is the feed bin; A, a heater; H does the work of cooking as well as heating. A work bench, W B, affords facilities for doing odd job of repairing, which is so often needed in such buildings. This main room is, or should be connected with all poultry houses for the convenience of the person who looks after the flock.



GROUND PLAN.

A Good House.

This house is eight feet high in front and six feet high in the rear. It is 8x12 feet and the roof is covered with tar paper. The first floor is of boards, covered with leaves or cut straw. The nests are in the rear, a box being prepared for that purpose, so as to allow the hens all the floor room possible. The small step or board shown at the right, allows the hens to ascend to the second floor for roosting, a trap door being placed in the second floor to allow them access. This is closed at night. The door for the upper room, with steps is shown at the left. The entrances to the nests are plainly seen at the rear of the house, to the left.

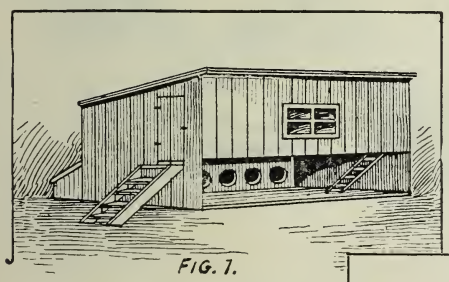


FIG. 1.

A GOOD HOUSE.

The rear view shows the nest boxes and the entrances to them. This arrangement permits the collection of eggs without entering the house. On the upper floor is shown a drawer, under the roosts; the droppings fall from the roost into this drawer and are removed by emptying the drawer, which can be taken out without entering the building.

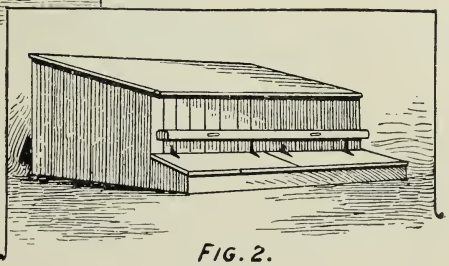
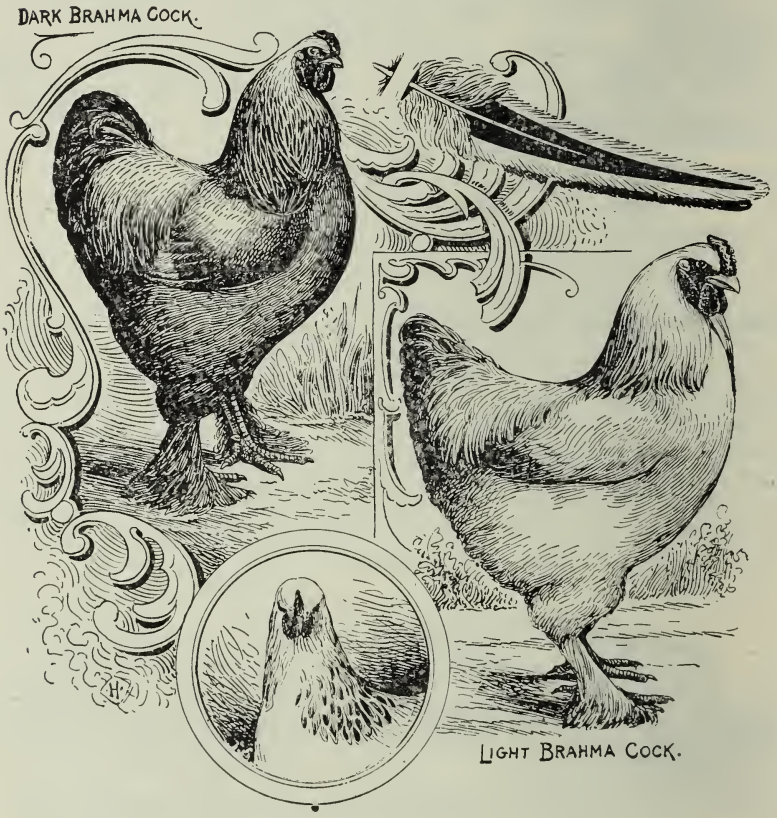


FIG. 2.

This plan necessitates going into the upper apartment but very little, and the

lower floor affords ample shelter from storms and allows plenty of air and light to enter the building. The upper floor is three feet from the ground, and is simply a roosting place, the hens occupying the lower floor during the day.



LIGHT AND DARK BRAHMA COCK.



KEEPING EGGS

THE attention of the poultryman has for some time been directed to the methods of keeping, or preserving eggs. By so doing he increases his income, and realizes a winter price for summer eggs. In summer when eggs are cheap it hardly pays to market them; this is the time when eggs should be packed for higher prices. As an adjunct to individual yards it can be made to pay well, but as a business of its own it is rather risky for many reasons. It is not because of the impossibility of preserving eggs in prime condition for several months, as it is not very difficult to do. Many families store eggs every fall for winter use, some by packing them in dry salt or in ashes, while others preserve them in lime water.

While it may be possible for a family it may be impossible for a merchant who buys eggs for the purpose of storing them. When the eggs are stored by the farmer's wife, she uses only those that are strictly fresh, discarding any that are the least suspicious, but when eggs are gathered from every source, it is impossible for the receiver to determine their quality. The first consideration in the matter of preserving eggs is the quality of them. As a farm industry it can be properly done under the best conditions and opens up a paying field to those who give it their attention. The rules to be observed for preserving eggs are: 1. Use infertile eggs; 2. Keep them in a cool place; 3. Turn them twice a week.

Eggs laid by hens not in company with males will keep three times as long as those laid by hens when with the males. Infertile eggs left in an incubator at a temperature of 103 degrees at the end of three weeks were almost as fresh as when put in, while the fertile eggs were rotten in less than ten days. If eggs are intended to be preserved, the males should be removed from the pens. Eggs keep best in a cool place, and the temperature should be between 40 and 60 degrees. If exposed to too low a temperature they will freeze and crack open. They should be turned over twice a week to prevent the yolks adhering to the shells.

The following processes for preserving eggs afford a valuable collection for the reader, and each method is given, with the authority attached, as a warrant of its reliability and practical use:

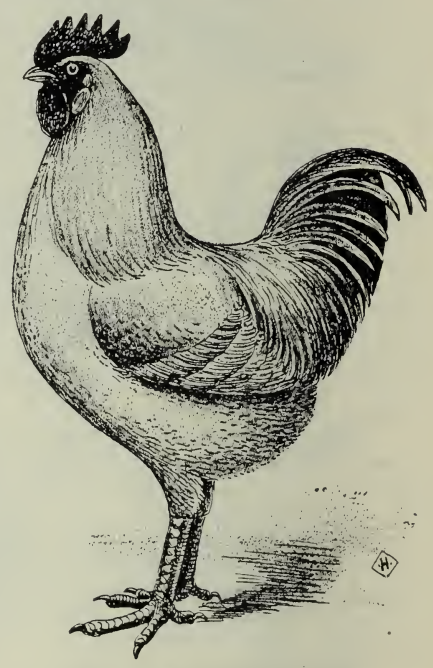
The Sulphur Process.

Take a common starch box with a sliding lid. Put the eggs in the box and upon an oyster shell or other suitable substance, place a teaspoonful of sulphur. Set fire to the sulphur, and when the fumes begin to rise briskly shut up the lid, make the box tight, and do not disturb it for half an hour. Then take out the eggs, pack in oats, and the job is done. If the oats or packing material be subjected to the same process it will be

all the better. If a barrel full is to be preserved, place the eggs in a tight barrel two-thirds full, with no packing whatever. Fire a pound of sulphur upon a suitable utensil, on top of the eggs in the vacant space over them, shut up tightly, let stand an hour, and then take out the eggs. As the gas is much heavier than the air it will sink to the bottom, or, rather, fill up the barrel with the fumes. In another barrel or box place some oats, and treat in the same way. Now pack the eggs in the oats, head up the barrel, and turn the barrel every day to prevent falling of the yolks, using each end alternately, and they will keep a year, or, according to the efficiency of the operation, a shorter or even a longer time.

The Havana Process.

Take 24 gallons of water, put it in 12 pounds of unslaked lime and four pounds of salt. Stir it well several times a day, and then let it stand and settle until perfectly clear. Then draw off 20 gallons of the clear lime and salt water. By putting a spigot in the barrel about four inches from the bottom you can draw off the clear water and leave the sediment. Then take five ounces of baking soda, five ounces of cream of tartar, five ounces of saltpetre, five ounces of borax and one ounce of alum; pulverize these, mix and dissolve in a gallon of boiling water, which should be poured into the 20 gallons of lime water. This will fill a whisky barrel about half full, and a barrel holds about 150 dozen eggs. Let the water stand about one inch above the eggs. Cover with old cloth, and put a bucket of sediment over it. Do not let the cloth hang over the barrel. After being in the liquid 30 days the eggs may be taken out, packed in boxes and shipped. Do not use the same pickle more than once. You need not wait to get the barrel full, but may place the eggs in the pickle at any time. As the water evaporates add more, as the eggs must always be covered with the liquid. It does not hurt the eggs to remain in the pickle. It is claimed that this process will keep them a year.



BUFF PLYMOUTH ROCK COCK.

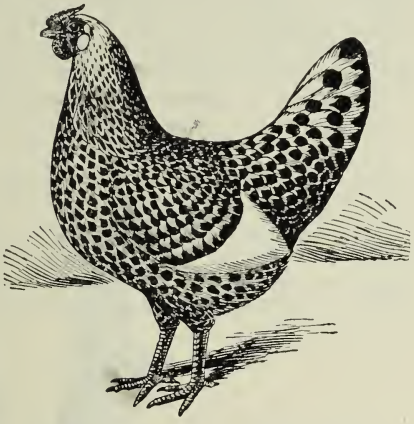
The Scientific American Process.

Having filled a keg or barrel with fresh eggs, cover the eggs with cold salicylic water. The eggs must be kept down by a few small boards floating in the water, and the whole should be covered with a cloth to keep out the dust. If set in a cool place the eggs so packed will keep fresh for months, but they must be used as soon as they are taken from the brine. To make the salicylic solution, dissolve salicylic acid, which costs about three dollars a pound, in boiling water, about one teaspoonful to the gallon. It is not necessary to boil all the water as the acid will dissolve in a less quantity, and the rest

may be added to the solution cold. The solution of brine should at no time come in contact with metal. In a clean airy cellar one brine is sufficient for three months or more, otherwise it should be renewed oftener. For that purpose the kegs, etc., should have a wooden spigot to draw off the liquid, and replenish the vessel. Salicylic acid is perfectly harmless, and yet is one of the best and certainly the most pleasant disinfectants in existence, with no color nor taste.

The Boston Globe Process.

An Illinois correspondent writes: Last summer I was induced to try packing down eggs for winter use. I had in seasons previous limed them, but a limed egg is not altogether to my taste. Last summer I took sweet, clean kegs, set them in a cool, dry place, with a barrel of powdered dry earth near at hand. In the kegs I placed a layer of this earth, then a layer of eggs, small ends down, then another layer of earth, and so on until the keg was filled. These eggs were quite good six months after packing. By placing the small end down the yolk is prevented from dropping down on the end and settling on the shell, while the dry fine earth keeps them from the air. I suppose ashes, bran or any other fine, dry substance is as good as the baked earth, but I write only of what I have actually experimented with.



SILVER SPANGLED HAMBURG HEN.

The Poultry Yard Process.

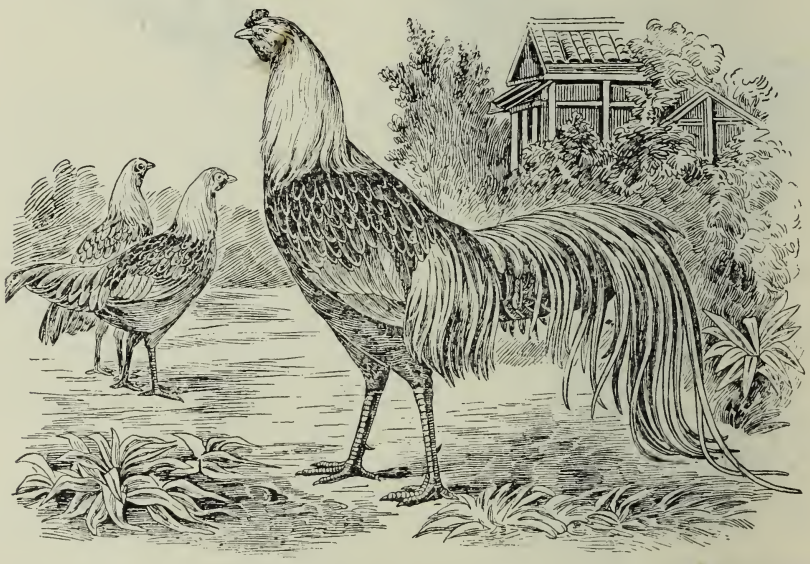
To keep eggs the "year round" take one pint of salt and one quart of fresh lime, and slake with hot water. When slaked add sufficient water to make four gallons. When well settled pour off the liquid gently into a stone jar. Then with a dish place the eggs in it, tipping the dish after it fills with the liquid, so that the eggs will roll out without cracking the shell, for if the shell is cracked the eggs will spoil. Put the eggs in whenever you have them fresh. Keep them covered and in a cool place and they will keep well for one year.

The French Farmer Process.

The plan of a French chemist for preserving eggs is as follows: While quite fresh they are gently struck against each other to see if they are "sound;" next they are placed in a kind of earthen pitcher, having a very narrow bottom. When the vessel is full, a solution of a quarter of an ounce of quicklime to one quart of water is poured in. The lime water permeates the shell till it reaches the first membrane, rendering the latter impervious. The pitchers are then placed in the cellar, from which all light is excluded, but a uniform temperature of from 44 to 46 degrees is maintained. In the course of a few days a pellicle forms on the top of each pitcher (carbonate of lime) and this must never be broken till the moment for withdrawing the eggs. This process enables the eggs to be kept fresh for six to eight months, and not more than five eggs in a thousand prove objectionable.

Prairie Farmer Process.

The keeping of eggs being almost wholly a question of temperature and the exclusion of air from them, it follows that that which will do both in the cheapest and most effectual way, will be the best. Hence eggs are kept in very great numbers by cold storage—that is, by providing a steady low temperature of about 35 degrees. But this is expensive. When, however, the temperature can be kept down to 75 degrees, and below, if eggs are packed in some dry, clean subtance which will exclude the air, they may be kept in a comparatively fresh state for months. This may be done in the following way: Provide clean, dry packages, not exceeding in capacity the quarter or third of a barrel, and a sufficiency of common, finely ground land plaster, such as is used for agricultural purposes. Commence by putting a layer of the plaster two inches deep on the bottom of the package, and into this set the eggs small end down, so that each egg will be separated from the other. When the strata of eggs is complete add more plaster, then another strata of eggs, then more plaster and so on until the package is full. If the work is done carefully, all the eggs are sound when packed, and each egg is separated from the other, and the temperature is not allowed to get over 75 degrees the result in every case will be satisfactory.



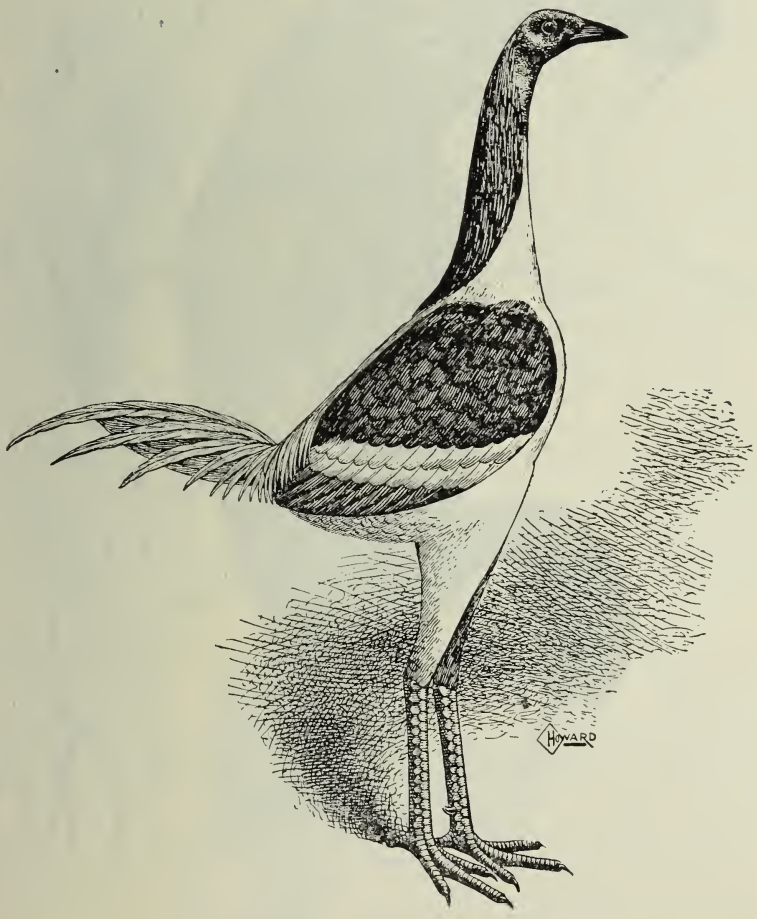
YOKOHAMA FOWLS.

The Birmingham Process.

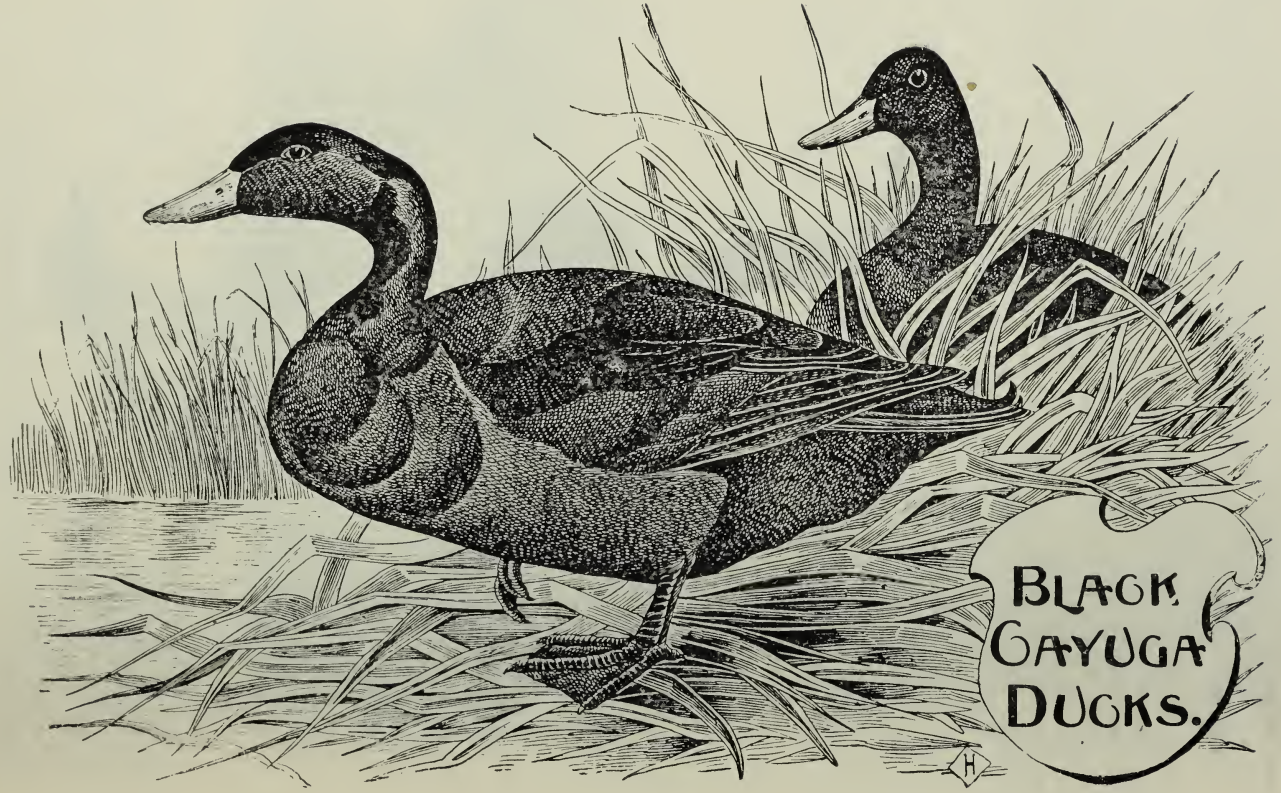
Melt one part of white wax to two parts of spermaceti, boil and mix thoroughly; or two parts clarified suet to one of wax and two of spermaceti. Take newly laid eggs, rub with antiseptic salt or fine rich starch. Wrap each egg in fine tissue paper, putting the broad end down, screw the paper tightly at the top, leaving an inch to hold it by. Dip each egg rapidly into the fat heated to 100 degrees. Withdraw and leave to cool. Pack broad end downward in white sand or sawdust.

Mrs. Moore's Process.

The way I put up eggs is this: I take a new box that will hold 20 dozen and put a thick layer of coarse salt on the bottom of the box; then every day as I gather in eggs fresh from the nests, I take clean, sweet lard and grease each egg carefully all over, and then set it in the salt with the small end of the egg down, until I have a layer of eggs set on end, and then I take salt and put over the layer of eggs, being careful to fill in between each layer of eggs solid, so there will be no danger of them becoming displaced when the box is turned. Keep on in this manner, alternate layers of greased eggs and salt, until the box is filled, taking care to put a thick layer of salt on top next to the cover of the box, then nailing on the cover tightly.



IDEAL PROFILE OF RED PILE GAME COCK.
(Standard Profile for Exhibition Ga nes).


BLACK
CAYUGA
DUCKS.

CAPONIZING

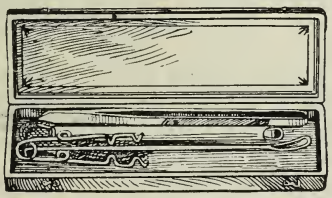
This branch of the poultry business has become well established, not only with the few who at first held the mystery, but it is universally recognized as an important factor of the poultry industry.

A capon is neither a hen nor a rooster, and is nothing more or less than a capon. The capon is to the cock what the steer is to the bull, the barrow to the boar, the wether to the ram. They grow larger than cocks, can be kept at less cost, and produce more meat for the food consumed than other fowls. Their flesh is delicious, and they are considered a delicacy in the markets, bringing double the price the year around of any other birds.

There are many advantages attached to caponizing which commend themselves to the poultryman. When poultry is kept for a profit, and we believe all fowls should be so kept, it behooves the keeper to be alert to every advantage which may increase the revenue from his yards. The farmer sees more weight in the steer than in the bull, and in the same proportion this applies to the cock and the capon.

The art of caponizing has in a measure solved the question of caring for the cockerels. There is a tendency invariably for the males to predominate in every brood hatched, and the practical poultryman knows the trouble and inconvenience of raising the usual number of cockerels hatched each spring They are continually chasing about the yard fighting, worrying the hens and pullets, and are in general a hindrance to the business. A cockerel is a ravenous eater, loses flesh almost as rapidly as gained, and, in fact, is a loss to the yard in the end.

By caponizing these ills are averted; he becomes very quiet and docile, spending most of his time in quiet and contentment. His entire nature is changed; he assumes the characteristics of a hen, never quarreling, and he may be confined with profit to a small space. This change of nature, and his quiet disposition causes him to increase rapidly in weight, and his flesh becomes juicy and tender, rivaling in flavor and delicacy that of a spring broiler. Instead of carrying to the market a poor and fleshless cockerel, you supplant it with a bird that equals turkey in size and weight, while the cost of raising the capon is even less.



SET OF INSTRUMENTS.

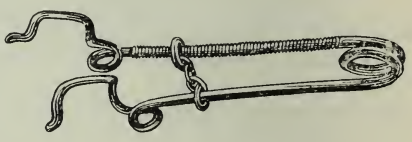
Breeds for Capons. The small breeds such as Leghorns, Hamburgs, Bantams and common fowls should not be caponized as the gain in weight in these would barely pay for the trouble. Large size birds with full, round breasts are the class that make the best capons. Always use such birds as the Brahmas, Cochins, Plymouth Rocks, Javas and Langshans. A fine capon is produced by a colored Dorking cock and a Brahma or Cochin hen; an Indian Game male on Langshan hens, or an Indian Game male on Dorking hens. The best breeds to select males from are colored Dorkings, Indian Games, Grey Dorkings, Houdans and Langshans. The hen may be from the Brahmas, Cochins or Plymouth Rocks. These give size and hardiness.

Time to Caponize. Hatch your cockerels early in the spring so that they may be cut before the hot weather begins; this is an advantage, yet good results may be had at any time during the year. The months usually taken for caponizing are June, July, August, September and October; at these times the young chicks from the spring hatches have arrived at the proper age and weight, and this affords ample time for marketing during January, February, March, April and May. Cockerels may be caponized when eight weeks old; the sooner the better. Remember the capon's comb does not grow like that of a cock, but shrivels away after the operation; its sickle feathers are not carried upright, and in appearance it is more like a hen. Cockerels should be caponized as soon as their combs begin to grow, as birds with combs will not sell so readily in the markets, and are likely to be taken for fowls.

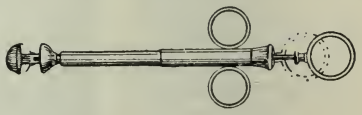
Instruments for Caponizing. Before explaining the operation it would be well to study the instruments now in use for that purpose. They are as follows: No. 1. Improved capon spreader, the best ever used for the purpose and very simple. No. 2. Old fashioned capon spreader, recommended by some who know little about the work. This is apt to fly out when working. We do not advise its use. No. 3. Spring cup capon forceps. No. 4. Improved Chinese spoon and hook. No. 5. Steel wire capon canula. It is used by catching the first and second fingers on the plate b b and pressing the thumb on a, the wire coming forth in the loop c ready for receiving or slipping over the parts, and on removing the thumb it will return to its first position, holding the spermatic cord firmly between the wire and the end of the canula. No. 6. Old style Chinese whalebone spreader, which has been in use in China for many centuries. No. 7. Chinese capon spoon and hook. No. 8. Chinese horse



NO. 2.



NO. 1.



NO. 3.



NO. 4.

hair canula. No. 9. Horsehair canula, improved. It is recessed out at the end just enough to allow the horsehair to fit the groove, freely



NO. 5.



NO. 6.

coming out against the abutment, the horsehair or wire being ready to be pushed forward after each operation. No. 10. This cut shows the method of holding the bird during



NO. 7.

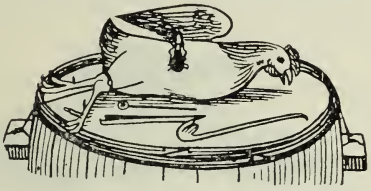


NO. 8.

the operation. No. 11. This shows the arrangement of the staples

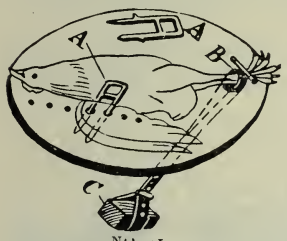


NO. 9.



NO. 10.

for holding the bird. It also shows how a good caponizing board can be made by using improved staple A to slide over the bird's wings. The bar crossing the middle enables you to use the upper part as a handle.



NO. 11.

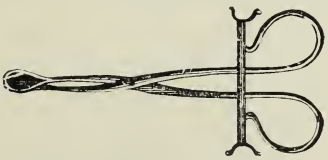
One point is longer than the other, to make its introduction into the board easier. With seven holes in the board it will take any size bird. B is a strap loop, with a pin across the top to prevent the strap from falling through the board when in use At the other end of the strap is a weight C for keeping the feet down



NO. 12.



NO. 13.



NO. 14.

No. 12. Steel wire caponizing canula. This has been used for a long



NO. 15.



NO. 16.

time. No. 13. Capon spreader. This also has been in use for quite a while. No. 14. Capon forceps. In use for some years. No. 15. Cords and hooks. No. 16. Capon knife and forceps combined.

How to Caponize. Caponizing is easily learned and successfully practiced by beginners by following directions, but more quickly and satisfactorily by witnessing the operation. Birds apparently suffer but little pain from the operation, and the per cent of loss is quite small. The only birds that die under the operation, as a rule, are those having developed combs. The old Chinese tools, when their use is understood, are very satisfactory. To avoid making slips in caponizing requires care and experience on the part of the operator. He must have a good chance to work, with plenty of sunlight and the chickens well emptied of food. Chicks that weigh one or two pounds are the best. Keep them from food 30 hours before you begin. Never try to caponize a chick with full intestines, as it takes more time, and the chances of success are not nearly so good.

Supposing now that you have your chicks well emptied of food and plenty of sunlight; next take a flour barrel with the head uppermost, then take two strings with a slip noose at each end, fasten a half brick to the other end of each string, tie one end around the chicken's legs and drop the brick over the other side of the barrel. Tie the other string around the wings close to the back of the bird, then drop the other brick over the other side of the barrel, as shown in Fig. 17.

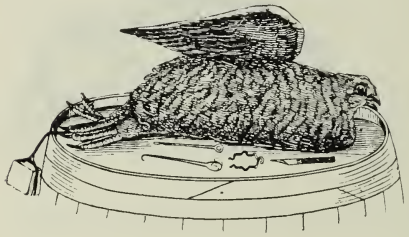


FIG. 17.

You now have your chicken on its left side ready for the operation. Pick all the feathers from over the last rib to the hip bone, then wet the feathers around the spot with ice water. This chills the part, thus preventing undue pain, and keeps all stray feathers out of the way. Now put your forefinger on the hip bone across the flank to the first rib, then introduce the knife between the two first ribs, as shown in Fig. 18, and cut down and forward to the end of the ribs, then turn the knife and cut between these ribs to near the backbone, put in the spreaders and open the ribs. See Fig. 19. Take the spreader between the thumb and first finger, press it until the two ends come together. Then insert the hooked ends in the incision, making sure to have the hooks between the ribs. Hold the spreader in position with the left hand.

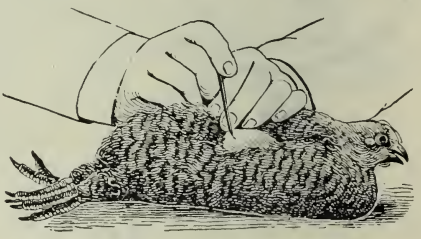


FIG. 18.

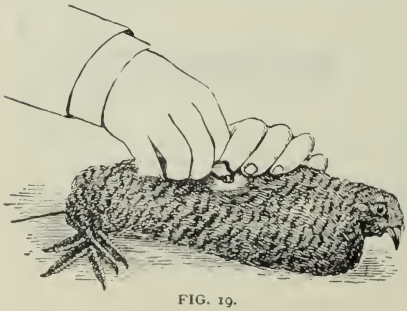


FIG. 19.

Take up the knife again. See Fig. 20. Increase the opening by cutting toward the backbone, and forward on the line between the ribs, until it is large enough to admit the free passage of the scoop twister. Care must be taken not to go too near the backbone, and always cut on a line with the veins instead of crossing them. See Fig 21. With the hoop end tear open the thin skin until you have the right testicle well in view, and plenty large enough to press the scoop twister through. This hoop must be used with care, or you may puncture an artery or the bowels. Take the probe in your left hand. With the ring handle push the bowels aside, and just below you will see the left testicle. Introduce the scoop twister with the right hand. See Fig. 22. Catch the lower or left testicle endways in the scoop. Then begin to twist the testicle off. Now remove the right or upper testicle the same as the left. The left testicle should always be taken out first as it is the hardest to remove. If the bird be all right after the operation it will generally have a passage.

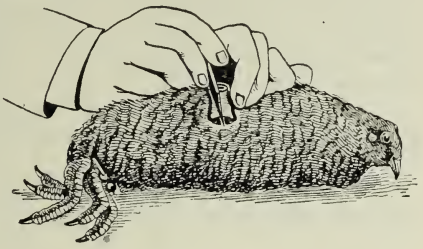


FIG. 20.

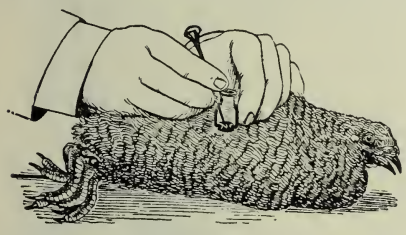


FIG. 21.

There is no difference in the food given them and other fowls after the first few days. They are, of course, without food from 24 to 26 hours before being operated upon, and are quite hungry. They should, however, be fed very sparingly for the first day or two, on cornmeal with a little salt in it. After that they can be given more. After the first week give them plenty of food; you will find them very ravenous for a month or two, then they gradually ease up and eat much less. When they are confined give bone-meal, broken shell, etc. Give plenty of fresh water.

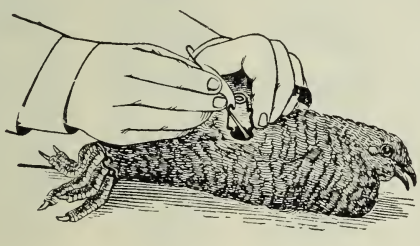


FIG. 22.

Fig. 23 shows a capon dressed for the market. It will be noticed that the spurs are not developed as in the case of the cockerel shown in Fig. 24. The comb and wattles are also undeveloped, while the plumage is very brilliant. It will also be noticed that the head of the capon does not look like the head of either a hen or a rooster. The cockerel shown in Fig. 24 is the same age as the capon. A glance at the two illustrations will show the difference between the two birds, and the advantages of caponizing.

Dressing Capons for Market.

The capon should be allowed to grow until at least one year old, as by that time it will have attained an imposing size, and becomes a beautiful bird. Some keep them even longer than a year. There is a vast difference between the flesh of the capon and other

fowls for table purposes. When the capons are ready for market select such as you propose killing and confine them. Keep them without food or water for 24 hours that their crops may be entirely empty. Prepare the place for killing and dressing. Drive two heavy nails about one foot apart in the beam or pole overhead. Make two nooses of strong twine, each noose long enough to hold one of the legs of the bird. The capon should hang low enough to be convenient for picking.

Next procure a table on which to dress the fowl. Make a frame on the same principle as a box without ends. In this lay the capon and remove the intestines.

When everything is in readiness take the bird and suspend him by the legs. Catch hold of its head and with your killing knife cut the vein at the back of the throat through the mouth. Never do this from the outside. As soon as the vein is cut, run the point of the knife through the roof of the mouth clear into the brain. Begin plucking at once.



FIG. 23.

In dressing, the feathers are left on the wings to the second joint, the head and hackle feathers and also those on the legs half way up to the drumsticks, all the tail feathers including those a little way up the back and the long feathers close to the hips are allowed to remain. These feathers add greatly to the appearance of the bird when dressed and also mark him from other classes. The head should never be taken off. The capon can readily be distinguished from any other fowl, as its comb and wattles cease to grow immediately after caponizing. Do not tear in plucking.



FIG. 24.

Now place the bird in the frame. Cut carefully around the vent and pull out the intestines. These will be found covered with fat which as they are removed should be pushed back. When the end of the intestines is reached, run your finger up in the bird and break it off, leaving everything else in. Let the birds hang in a clean, cool place until thoroughly cooled.

For packing use new boxes of any size required, lined with white paper. Pack the birds, and they are ready for market.

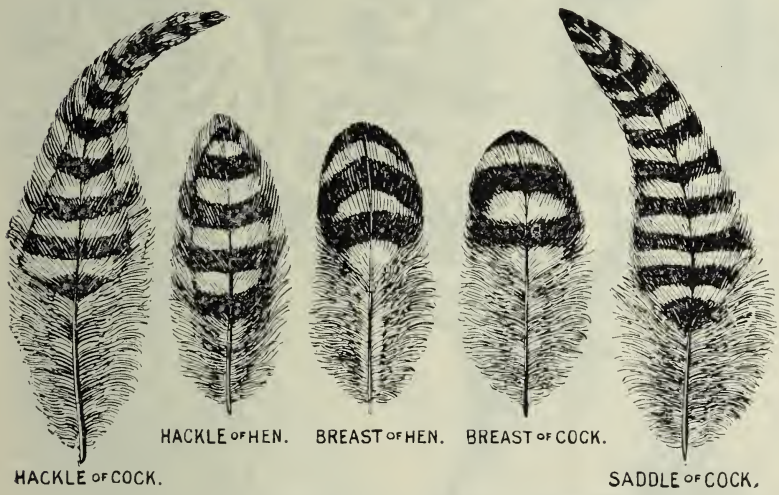
Capons as Mothers.

One other advantage the capon has over cockerels is that it can be used for raising chicks, while the hens go back to laying. With a little training the capon makes an excellent mother, taking the best possible care of a brood of 25 or 30 chicks. They will care for young chicks all season and yet get fat themselves. Their large size enables them to care for twice the number that a hen would, besides he can scratch and protect them better. When a capon is nine or ten months old he is ready to assume maternal duties. If you have chicks ready catch the capon and pluck a few feathers from his breast, and at the same time switch him lightly with a cedar twig or anything that stings him a little. This will cause his breast to itch. Place him in a dark box, about two feet square and low

enough to prevent him from standing. Then put two or three chicks with him. These he will probably kill; then he should be taken out and switched again on his breast, after which he may be placed back in the box, and more chicks given him. This time he will probably be glad to have them with him, as his breast will itch so he will be glad to have them huddle under him; he will cluck to them eagerly and treat them as kindly as an old hen.

Keep him under the box 24 hours, with the chicks, giving them a few bread crumbs and a little water. Have just light enough for him to see the food and water, and be sure that he is far enough from the old hen to prevent the chicks hearing her call. The next day he may be put in an open coop and as many chicks given him as is desirable. They should be kept here for several days and then may be allowed to roam at will.

Other chicks may be given him from time to time, but always at night, at the same time taking the chicks that are large enough from him. In this way one capon will bring up a great many chickens in a season, and the hen's time is not lost.



FEATHERS OF BARRED PLYMOUTH ROCK



THE MUTE OR WHITE SWAN.



The greatest drawback to poultry raising comes from diseases which affect the flocks. When fowls are in perfect health and yielding a good supply of eggs, poultry keeping is a pleasure to the keeper; and yet, when many little ailments, so common with fowls, arise, there is a lavish disgust from all, and the industry is condemned. While it is proper to treat the sick birds, how much better is it to study the ways of preventing disease in the flocks. Almost all diseases arise from neglect and mismanagement by the keeper, who overlooks the details and establishes irregularities which weaken the hardiest constitutions and invite disease among the flocks. Fowls are, as a rule, free from disease, and it seldom appears without a discernible cause. Fully two-thirds of the sickness can be attributed to filthy houses, impure water and improper feeding. To these may be traced many diseases that should never appear in a poultryman's yard who professes to care for his feathered friends or has hopes of realizing an income through this source.

The housing space should be in proportion to the number of birds kept, and over-crowding should never be tolerated under any circumstances. Closely confining a number of fowls in a small space with no ventilation, and compelling them to breath over and over again the foul air which is always generated in occupied quarters, encourages the development of disease germs. Cleanliness about the coops and houses is necessary to avoid disease. The accummulation of droppings, vermin, lice, red mites, etc., which are found in badly kept coops or houses, are the generators of disease. The droppings should be removed, and dry earth spread on the floor and under the roosts. Coal ashes are excellent for this purpose, and when mixed with the droppings, become valuable as a fertilizer. The entire interior of house should be whitewashed and kept thoroughly cleaned. Carbolic acid is the best disinfectant for the poultry house; while it may not have a pleasant odor, it is the most healthy odor that can be had in the building. In the whitewash it would be well to use about a fluid ounce of carbolic acid to a bucketful of the wash.

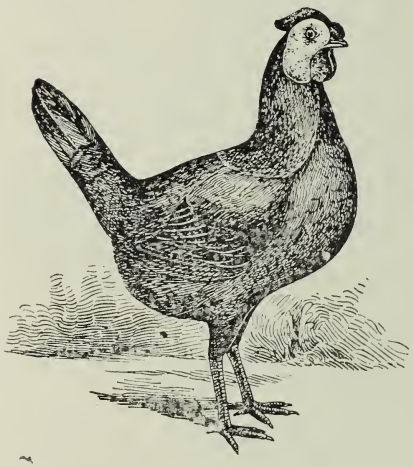
Pure, fresh water should always be at hand for the fowls to drink. In the stagnant ditch, the sink spout, and the leaching from the barnyard may be found many germs of disease dangerous to the fowls There is not a single person who for a moment would think of giving

such drink to other stock on the farm, yet they do not hesitate to allow the fowls to drink freely of the same. If other animals need pure water to keep in health, do not fowls need the same? This feeding of poison to the fowls is to be avoided by providing pure water for them regularly in clean drinking vessels. Another cause of disease may be found in the improper use of various foods. A regard for the digestive organs and the foods to be used in different seasons and conditions is an important factor. Imprudent feeding, and the use of the wrong kinds of foods, is sure to weaken the constitutions of the birds and establish the foundation for disease.

When you think a fowl diseased, remove it at once from the flock and place it in a clean, warm place, free from the molestation of the remainder of the flock. If it die from disease, it is best to burn the carcass and prevent contagion.

Apoplexy.

Symptoms. In apoplexy the fowl appears to be dizzy; it staggers and falls down without any power of motion. The disease may occur to fowls apparently in perfect health; the symptoms are occassioned by the rupture of a blood vessel in the skull, and the influx of blood into the brain may be so strong that the fowl dies. The pressure of the blood upon the brain produces the evil. The cause is overfeeding with unnatural and over stimulating food, such as Indian corn hemp, and pea and bean meals in too large proportions. The disease is common with laying hens—which are sometimes found dead on their nests—when the blood vessel may be weak and straining causes the attack.



WHITE FACED BLACK SPANISH HEN.

Treatment. Little can be done toward the cure of this disease, while much can be done to prevent it. Feed judiciously. Hold the head of affected fowl under a stream of cold water, which will drive the blood from the brain. If this does not have an immediate effect, the bird must be bled. Cut into the large vein under the wing; the incision should be made longitudinal, not across; let the blood flow freely. If the bird shows signs of returning life, stop the bleeding with alum, or by pressing on the wound with the fingers. Keep the bird on a light diet if it recovers.

Black Rot.

Symptoms. This disease is most common with the Spanish fowls, and usually commences with the blackening of the comb, followed by swelling of the legs and feet and emaciation.

Treatment. Treatment is only efficacious in the earlier stages, and consists of a dose of calomel or castor oil, followed by some simple tonic, with warm and nourishing diet.

Bronchitis.

Symptoms. The disease is distinguished by frequent coughing and an aggravated catarrh.

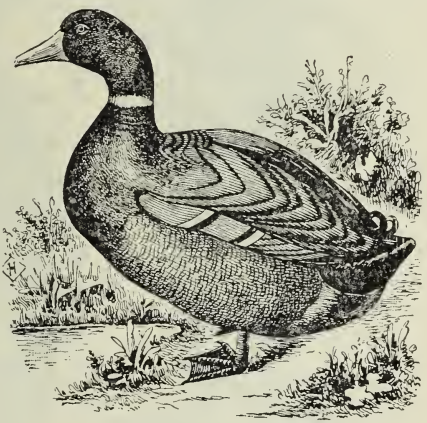
Treatment. Remove the fowl to a dry and warm place, and give sweetened water slightly acidulated with nitric acid. A stimulant of a little cayenne or ginger may be beneficial to the bird.

Bumblefoot. *Symptoms.* This term is applied to the corn or abcess which follows from a bruise of the skin. It may be caused by too narrow perches, or by walking upon sharp gravel, which bruises or irritates the skin, or jumping from high roosts.

Treatment. In cases where the tumor is soft and full of pus, or in the form of an abcess, a free puncture may be made, the matter pressed out and the part washed with warm water. In other cases where the tumor appears hard, an incision should be made in the form of a cross. Until the bird is cured the perch should not be over six inches from the ground, and the floor where the bird is confined should be well covered with chaff or chopped straw so as to relieve the pressure on the bird's foot as much as possible. It would be better if the bird was compelled to set upon the straw with no roost at all.

Canker. *Symptoms.* This has frequently been alluded to as ulceration; it usually occurs about the head, commencing with a watery discharge from the eyes, as with roup, which by degrees becomes firmer in character, and offensive in odor. The disease frequently extends to the throat, covering the back of the tongue with an ulcerous formation, sometimes entirely filling the larynx with the diseased secretion, and killing the bird by suffocation.

Treatment. Wash with a solution of four parts of water to one part of chlornated soda or fluid carbolate, and "swabbing" the throat and tongue if affected with a solution of this strength. Give this treatment three times a day, and mix a teaspoonful of powdered sulphur with the food.



ROUEN DRAKE.

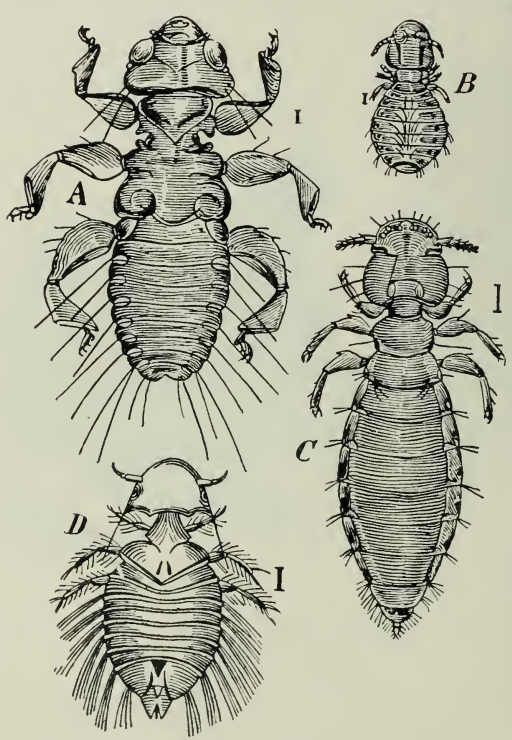
Catarrh. *Symptoms.* Most fowls suffer from and all are subject to a common cold, which is shown by the slight discharge from the eyes and nostrils. It is not dangerous, but if neglected may result in roup.

Treatment. Place the fowl in a warm, dry place, and give three drops of No. 1 aconite in a half pint of drink. Feed soft food only, mixed with warm water, and seasoned with No. 1 mixture, under "Feeding of Condiments." In case the fowl does not improve in a few days, treat as for roup.

Cholera. *Symptoms.* The first symptoms of cholera is in the yellow coloration of the part of the excrement which is excreted by the kidneys, and which is normally of a pure white. This yellow color appears while the excrement is yet solid; the bird presents a perfectly healthy appearance; the appetite is good, and before there is any rise in the temperature. This excrement consists

largely of urates suspended in a thin, transparent mucus, having a deep yellow coloration which may, in the later stages of the disease, change to a greenish, or even deep green color. With the beginning of the disease the temperature of the bird rises, reaching 109 to 110 degrees, or from two to four degrees above the normal; the comb loses its brightness; the appetite is lessened; the wings droop and the bird becomes inactive. In the last stages the fowl loses in weight, is very weak, and walks with the greatest difficulty. Death frequently occurs without a struggle, but in the majority of cases there are convulsions and cries. Sometimes the bird dies within 24 hours after the first coloration. In most cases the bird is thirsty throughout the period of disease. The causes may be enumerated at great length, but only the more important are given; unwholesome food, impure and stagnant water, exposure in hot weather.

Treatment. Separate the affected fowls from the flock at the first symptoms of the disease. It is the most contagious as well as most destructive disease of fowls. A regular supply of fresh meat is a preventative of the disease. To cure give the affected bird one pill every four or five hours of blue mass, 60 grains; pulverized camphor, 25 grains; cayenne pepper, 30 grains; pulverized rhubarb, 48 grains; laudanum, 60 grains. Mix and divide into 20 pills. After the pills have had time to act give half a teaspoonful of castor oil and ten drops of laudanum to each bird. Give as a drink scalded sour milk with a gill of Douglass mixture (see "Feeding Condiments) for every 24 fowls. Another recipe is as follows: Powdered garlic, one ounce; aromatic tincture of rhubarb, one-half ounce; tincture of capsicum, two drachms; tincture of camphor, two drachms; oil of peppermint, three drachms; tincture of opium, one drachm. Mix and shake well until the powdered garlic is thoroughly suspended. Dose, six to eight drops in a teaspoonful of water three times each day. A good recipe for mixing with the soft food may be found in the following: Cayenne pepper, one-half ounce; alum, one-half ounce; resin, one-half ounce; sulphur, one-half ounce. Give one teaspoonful of this mixture to three pints of scalded meal daily. Or, two tablespoonfuls of Epsom salts, four tablespoonfuls lime and ten drops of tincture of iron in a gallon of meal.

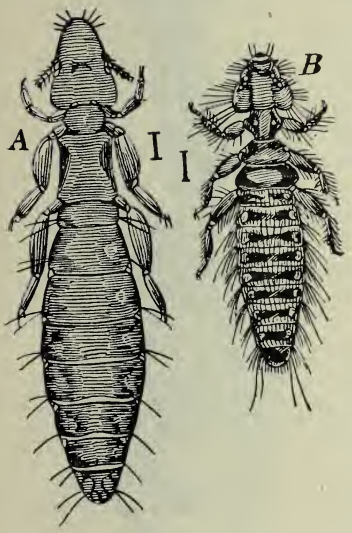


LOUSE OF THE GOOSE.
A. Trinton lituratum. *B.* Docoporus. *C.* Ornithobius cygni. *D.* Goniodes stylifer.

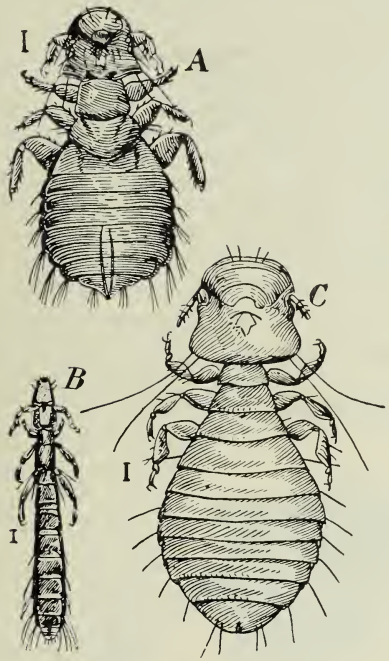
Consumption.

Symptoms. The causes are confinement in cold, dark and unhealthy places. The disease is strongly marked in a chronic cough with evident wasting and loss of strength, and an expectoration of matter. Cure is hopeless when the disease has developed to any extent.

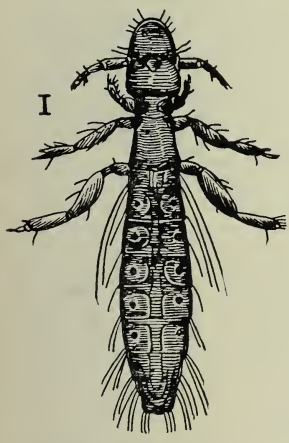
Treatment. Consumption may be prevented by wholesome, abundant diet and good housing; in its advanced stages it is incurable. When the disease is suspected, cod liver oil may be given with meal. The disease is hereditary, and the bird should not be used for breeding purposes.



LOUSE OF THE DUCK.
A. Lipeurus squalidus. *B.* Trinoton hiridum.



LOUSE OF THE PIGEON.
A. Goniodes damicorius. *B.* Lipeurus baculus. *C.* Goniocotes compar.



LOUSE OF THE TURKEY.
Lipeurus polytrapezius

Cramp--- Rheumatism.

Symptoms. These generally come from exposure to cold and wet, running in wet grass, wet roosting places, etc. The symptoms are leg weakness, stiff joints or contraction of the toes. The malady is hereditary and is most frequent among early chicks.

Treatment. Place the affected birds in dry quarters, and give stimulating food; a little cooked meat every day. Rub the legs well with hot mustard water, and wipe dry. A half grain of opium for a chick over four months old, and a quarter of a grain for a chick under that age given night and morning will result in much good.

Crop-Bound.

Symptoms. This is a form of indigestion. The crop becomes extended with hard grain, pieces of bone and undigested food. It becomes swollen by the moist secretions intended to digest the food, and the outlet into the stomach is closed by the pressure.

Treatment. Warm water should be poured down the the throat of the fowl, and the crop should be gently kneaded with the hands for an hour or so. If this fails make a cut in the crop about an inch long, at the top, and remove the contents with the handle of a spoon. Then pass a greased finger, after having pared the nail blunt, into the crop and find if it is clear. Sew the opening of the crop with white silk or horse hair. Then stitch the outer skin in the same manner; taking care that the stitching be only through one skin at a time. Feed on soft cooked food for a week and give a limited supply of water.

Diarrhœa-Dysentery.

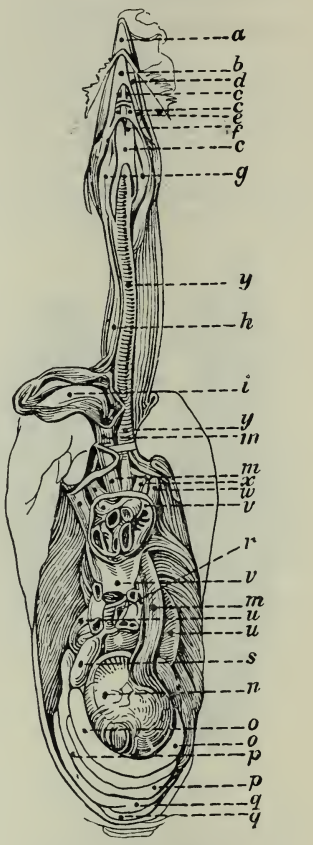
Symptoms. A sudden change of diet; to much green food; or a sudden change of weather may cause this disease.

Treatment. If the looseness be observed early it can be checked at once by feeding boiled rice mixed with chalk powder. If this proves ineffectual, give three times a day a pill of barley meal with six drops of camphorated spirit. Give a little iron in the drinking water.

Dysentary is really diarrhœa in a severe form, and is evidenced by the evacuations being mingled with blood. When the disease has reached this stage it can rarely be cured. Give a dose of castor oil, and every four or five hours a few drops of laudanum. Keep the fowls confined and at rest.



CANAL OR OVIDUCT.

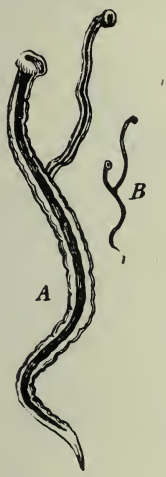


PRINCIPAL VICERA OF YOUNG COCK.

References.—*a.* The under beak. *b.* Membrane of the mouth at the side of the tongue. *c.* Muscles of the tongue (*os syoides*) and lower jaw. *d.* A thin salivary gland, entering the mouth by several small orifices. *e.* A small salivary gland, whose duct passes through the membrane of the mouth at the side of the tongue —the right one is turned outwards to show these ducts. *f.* A small cartilage belonging to the *os hyoides*. *g.* The fauces. *h.* The oesophagus, above the crop. *i.* The crop laid open. *k.* The upper orifice into the crop. *l.* The lower orifice. *m.* The lower oesophagus. *n.* The gizzard. *o.* First turn of the duodenum. *p.* Second turn of ditto. *q.* The other intestines. *r.* The basis of the liver, the body of it being cut out to show the six orifices of the *vena cava hepatica* and *vena portarum*. *s.* The gall bladder. *t.* The spleen. *u.* The two testicles. *v.* Attachment of the pericardium, within which is seen the heart, exposing the mouths of the vessels coming in and going out. *w.* The *nerve cavoe superioves*. *x.* The two arotids and sub-clavians. *y.* The trachea. *z.* Suspensory muscles of the trachea.

Egg Bound. *Symptoms.* This is caused by the egg being too large and is especially common with Polish fowls. Eggs have been known to accumulate and form a large tumor. The hen comes off the nest without laying and walks about the yard as if distressed, hanging down her wings; sometimes she remains on the nest.

Treatment. Give a tablespoonful of castor oil. If this is successful wash the vent with warm water, and then pass in an oiled feather. An injection of an ounce of sweet oil may prove a better remedy in stubborn cases.



THE GAPE WORM.

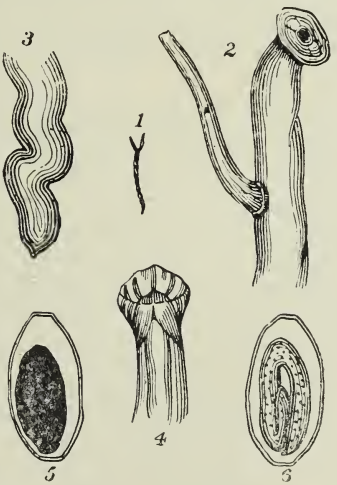
B.—Full-grown gape worm, natural size, male and female. A.—The worm largely magnified.

Egg Eating. This is an aggravating vice and should be remedied as rapidly as possible. Its influences are felt and spread throughout the entire flock if not taken in hand at the first appearance. There are various plans of nests arranged for fowls given to this habit, and the figures of some of them are shown in the illustrations. The vice may also be prevented by having the nest in dark corners and by giving the confined fowls plenty of work. Place their grain food under straw and cause them to scratch for it. If these fail, it is advisable to dispose of the bird, before the entire flock become addicted to the habit.

Feather Eating. This vice is found among all breeds, but more especially among the French and Malay breeds. It invariably appears in the hens. It may be traced directly to thirst and idleness. Keep cool, fresh water always within the reach of the birds. Give as much exercise as possible. Many cases may be cured by a diet on animal food. Fresh meat and crushed bones should be fed liberally.

Frost Bites. Frost bites affect the feet, comb and wattles. The large combed breeds especially suffer from it. If you detect the trouble before the frozen parts have thawed, thaw out by friction with snow or cold water, and keep the fowls where it is cold. After thawing, bathe the affected part with glycerine. Prevention is, however, better than cure, and in most cases may be insured by oiling the combs and wattles with a sponge every morning.

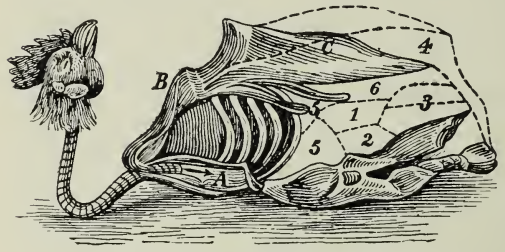
This treatment protects the tissues and prevents water adhering and freezing on the wattles when the fowls drink.



GAPE WORM AND EGGS.

1. The worm, life size. 2. The upper portions of the pair magnified. 3. The tail of the female. 4. The membraneous sucker from the lower end of the body of the male, which attaches itself to the female. 5. The egg of the worm. 6. The egg with the embryo in an advanced state of development.

Gapes. *Symptoms.* This disease is most common among young fowls, and is caused by the windpipe being infested with small reddish worms, causing the chick to gape for breath, and death ensues from suffocation. The scientific name of the worm is *Syngamus trachealis.* The disease is not alone common with chickens, but attacks turkeys, ducks and all domestic fowls, besides many birds in their wild state. The worm is about three-quarters of an inch long, of a pale reddish color. It is always found double; a smaller worm being forked on about one-fourth from the upper end, like the letter Y, which latter is the male. This parasite permantly attached to the female. Propogation is by means of eggs which are about one-two-hundred-and-fiftieth part of an inch in diameter. The number found in one chicken varies from one to three dozens, when the bird strangles to death.



APPARATUS OF RESPIRATION.

This figure represents the apparatus of respiration of birds:—*A.* The solid lungs, which are not movable. *B*, *C.* The bones of the body, the breast bone, *C*, extending the whole length of the body. 1, 2, 3, 4, 5, 6. The air cells occupying the thorax and abdomen, which here form one cavity or series of cavities. These are dilated when the chest rises to the upper dotted lines.

Teatment. While no resemblance is found between the egg of the gape worm and that of the louse, it has been found that the treatment of rubbing the bird's head with sulphur and lard for lice, has prevented, if not cured the affected birds. Cleanliness is to be always paramount in the poultryman's yards. The following ointment has been found very good: Mercurial ointment, one ounce; pure lard, one ounce; flour of sulphur, one-half ounce; crude petroleum, one-half ounce. These should be mixed well and applied to the head of the chick.



A common method of treating a bird affected with the gapes, is to take a feather which has been stripped of the web (see cut), except at the tip, (as shown in the cut), and dip it into sptrits of turpentine, or kerosene, and thrust into the windpipe, turning the feather around several times. When the feather is withdrawn the worms will come with it, while others will be coughed out at once. Be careful while treating a bird this way to catch all the worms that may be coughed out on a piece of paper, and burn them. It is well to bend the feather as shown in the cut, when treating small chickens; be sure to place the doubled point in the windpipe, and push it down gently as far as it will go; twist it around several times before pulling out. Place in the drinking water a few drops of carbolic acid, or camphor or lime to prevent infection. When a fowl is noticed sick, separate it from the flock and place it under immediate treatment. All fowls that die should be burned. Camphor in the form of pills has often been given with success. Alum and sulphur in the form of a fine powder blown down the throat will destroy the worms.

Giddiness. *Symptoms.* The fowl will be noticed running around in a circle; or it will sragger, as if drunk. This is caused by pressure of blood upon the brain.

Treatment. Catch the bird and hold its head under a stream of cold water. It should be given a dose of Epsom salts. If the bird is neglected apoplexy may be developed. Keep it quiet and feed a low diet until it recovers.



OVARY.

Gout. *Symptoms.* Some are likely to mistake this disease for leg weakness, but it may be distinguished by the legs and feet being hot, with evident swelling.

Treatment. Remove the bird to a warm, dry place, and give a dose of calomel to open the bowels; after which give a half-grain pill of extract of colchicum twice a day. Rub the legs and joints with sweet oil.

Indigestion. *Symptoms.* The bird appears lazy and walks about in a sluggish manner. It is caused by neglect and imprudent feeding. It occurs after the use of spiced food; and is also caused by over-feeding. The bird loses its appetite and will not eat the ordinary foods; the droppings of the birds also show ill health. The liver is sluggish; the stomach inflamed and the system generally debilitated.

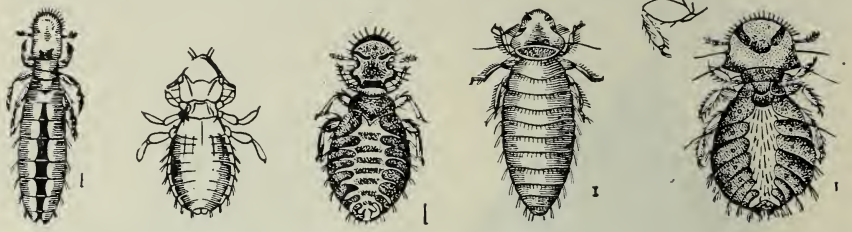
Treatment. Give daily five grains of rhubarb, and every fourth day one grain of calomel. Feed a small amount of well cooked food twice a day, and allow water only after eating. Give powdered charcoal in the soft food.

Leg Weakness. *Symptoms.* This disease is most noticeable on account of the tendency of the birds to squat on the ground instead of standing or walking about. It is common with cockerels of large breeds, and is evidently caused by growing too fast, and arises from muscular weakness or from a deficiency of bony matter.

Treatment. Feed with foods that do not tend to produce fat. Some of the best are wheat, barley and meat. Use bone dust freely. A pill of the following, given three times a day, will produce good results: Sulphate of iron, one grain; strychnine, one-sixteenth grain; phosphate of lime, five grains; sulphate of quinine, one-half grain. The cure of leg weakness is not difficult in all cases, and by a prompt treatment you will in most cases be successful.

Lice. *Symptoms.* This subject claims a goodly share of the attention of the poultryman. It is a serious matter when lice once get a start in the houses, and the losses therefrom are often very heavy. Many times in this work we have spoken of cleanliness in the houses and

yards, and we earnestly admonish the reader on this subject again. It is a much easier task to prevent lice than to exterminate them after they get a foot-hold. Lice breed in dark and filthy places, cracks and crevices. They are sure to be found in such places—they are not cleaned regu

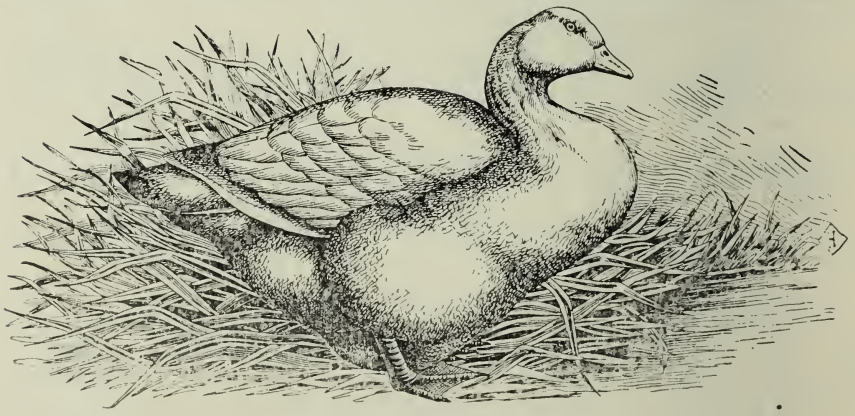


Lipeurus variabilis. *Goniocotes burnetti Pack.* *Goniocotes abdominalis hologaster of Denny* *Menopon pallidum.* *Goniodes dissimilis.*

LOUSE OF THE HEN.

larly. This complaint is liable to lead the observer astray, and he will fear that his fowls are attacked with some grave disease. When vermin infests a fowl, it looks droopy, as if drawn up in a knot; loss of appetite is noticeable and the bird is generally debilitated. When you see a bird like this it would be well to examine it before treating for some other disease of complaint.

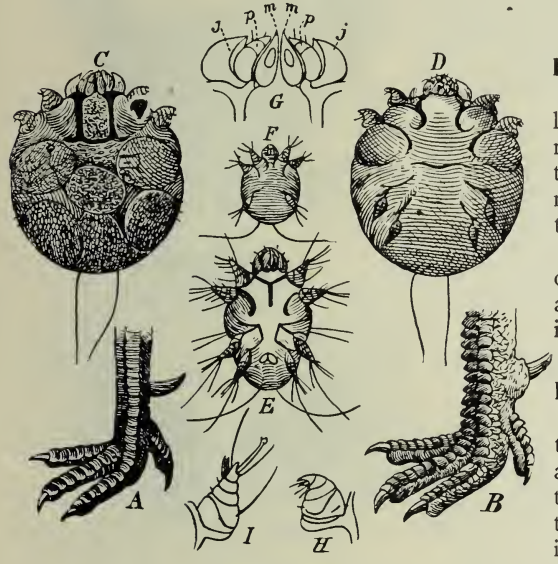
Treatment. There are two points essential to treating fowls for lice, viz: the houses and the fowls. As regard the treatment of the houses, we refer you to the chapter on General Management. For treating the fowls, the most popular remedy is Persian insect powder. Other remedies are as follows: A bath of one part of carbolic acid to sixty parts of water, into which the birds are dipped; suds of carbolic soap may be applied to the fowls, on all places underneath the wings, etc. This should



EMBDEN GOOSE.

be done carefully, and in cold weather care should be taken that the birds do not catch cold. Carbolic powder or powdered sulphur may also be used. Under the wings of full grown hens, an ointment of lard, kerosene and sulphur may be applied, but on small chicks never use kerosene.

The treatment for red mites is about the same as for lice. In the application of remedies to the fowls, special care must be taken with the back of the neck, under the wings and over the vent. Keep the building thoroughly whitewashed.



SCALY LEGS.

A. Healthy leg. *B*. Diseased leg. *C*. Female, front view. *D*. Back view of ditto *E*. The male. *F*. Six-legged larve. *G*. Rostrum; m m, mandibles; p p, feelers; j j, checks. *H*. Front leg of female. *I*. Ditto of male, nymphs and young females.

Liver Disease. *Symptoms.* When a fowl is affected with this disease, the head and comb have a sickly yellowish look. If neglected, mere indigestion may extend to a serious enlargement or other disorder of the liver.

Treatment. Give a grain of calomel every other day and feed as directed for indigestion.

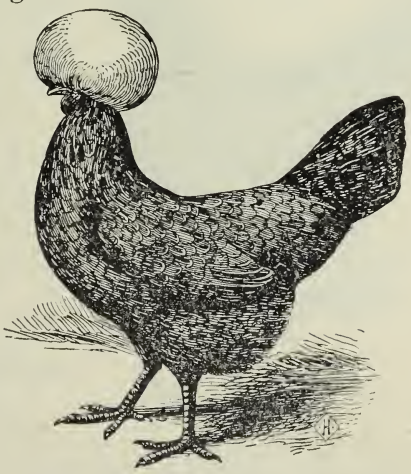
Pip. *Symptoms.* It is distinguished by a hard, horny substance on the end of the tongue. This arises from obstruction of the nostrils which causes the bird to breathe through its mouth, thus drying the tongue. Indigestion may also cause it. The best authorities agree in considering it a symptom of disease elsewhere.

Treatment. When treating for this complaint give a gentle purgative, and diet carefully. Two or three grains of black pepper may be given daily as a stimulant to the digestive organs.

Rheumatism. *Symptoms.* This disease is marked by an evident weakness in the legs, stiffness in the joints, or contraction of the toes. It generally results from exposure to the cold or wet, wet roosting places, etc.

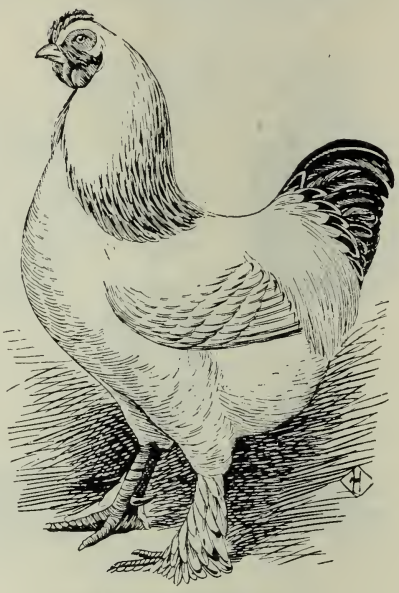
Treatment. Place the affected bird in dry quarters, and give plenty of stimulating food. A little meat every day should be given. Rub the legs with hot mustard water, afterwards wiping dry.

Roup. *Symptoms.* Among the most dreaded diseases is roup, and it is extremely contagious. The germs of this disease may be communicated by drinking or other contact—



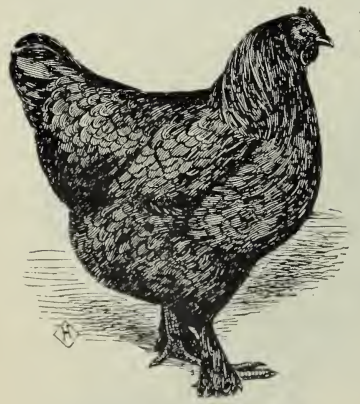
WHITE CRESTED BLACK POLISH HEN.

through the characteristic roupy discharge. The symptoms are those of a very aggravated catarrh or cold of the head, with fevers, inflamed head and eyes, a dry cough and a dull wheezing. The fowl drinks eagerly; the comb and wattles are pale or dark colored. There is a yellowish discharge from the throat, nostrils and eyes; a cheesy mass collects around these organs and if not attended to immediately, will close them entirely. Death occurs within three to eight days from the time of the disease's first appearance. Colds, canker and ulceration are often mistaken or confused with roup; in these three mentioned the discharges are usually thin and watery; when roup is really the case, the discharges are thick and have a very offensive odor.



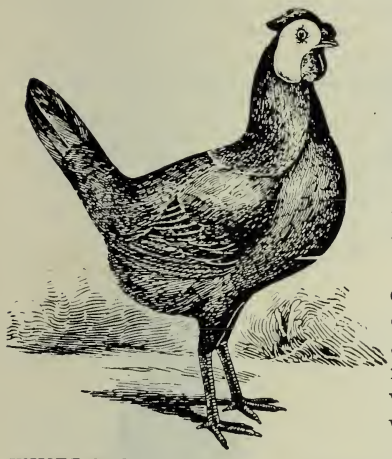
LIGHT BRAHMA COCK.

Treatment. The bird should be isolated at the first signs, for fear of contagion; the water vessels should be thoroughly cleaned, and refilled with water containing a few drops of carbolic acid. Place the affected bird in a warm, dry place and free from draughts, with dry sand on the floor. Give warm, stimulating food. Commence treatment by giving a spoonful of castor oil. Wash the nostrils, eyes and other affected parts with a Solution of Chlorinated Soda, diluted with twice its bulk of water. Repeat this several times a day. Give the following twice a day: Balsam copaiba, one ounce; liquorice, in powder, one-half ounce; piperine, in powder, one drachm. Add magnesia enough to make pills, and divide into 60 parts. Generally under this treatment the bird will recover, if not too badly affected before treatment is commenced. Another remedy, which is handy in form and is highly recommended, is German Roup Pills. It has long been before the poultry fraternity and has given satisfactory results. If the bird recovers, do not return it to the flock at once, but keep it on a tonic for some time. If possible, avoid breeding from a bird that has recovered from the disease.



BLACK LANGSHAN HEN.

Scaly Legs. (Elephantiasis.) *Symptoms.* The disease known as scaly legs is distinguished by the development of a rough, unsightly scurf on the shanks of the fowl. It occurs more frequently among the Asiatic breeds, or those formed, as the Leghorns, by crossing with them; and the breed most subject to the attacks of the disease is the White Cochin. In the Buffs it



WHITE FACED BLACK SPANISH HEN.

is not uncommon; in the Partridge Cochins and Langshans it is more rare, and in the Brahmas it is very rare indeed The disease is due to a parasitic insect, and is very contagious, especially being communicated by the hen to her brood. The fact has been demonstrated that the cause of the disease is sudden exposure to cold and wet, especially walking in the snow.

Treatment. Place the bird in dry, warm quarters. In the early stages of the disease, a vigorous scrubbing with soap and tepid water, with a hard brush, will most likely effect a cure. In extreme or very bad cases, an application once a week of kerosene and lard will remove the scales. Make the ointment in the proportion of one teaspoonful of kerosene to four times that amount of lard. In young chicks, an application of glycerine is all that is needed.

Soft Eggs.

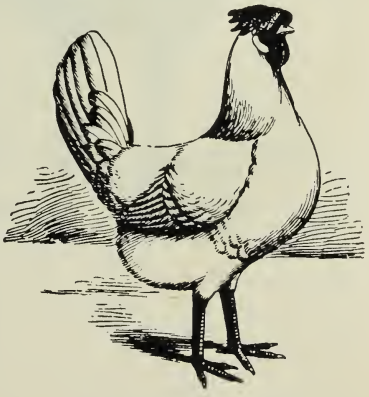
Symptoms. When soft eggs occur frequently it is almost always a sign of overfeeding, but sometimes the cause of these is the entire absence of any material from which to form the shell. As a rule, when the hen lays an egg without the shell, it is an indication of a weakened constitution, and steps should be immediately taken to remedy it.

Treatment. When the egg is complete, all but the shell, miss a meal, and feed less than usual; but if the egg is devoid of the outer membrane, and the yolk only is dropped, it is well to arrest egg production for the time being, by giving a pill containing one grain of calomel, one-twelfth of a grain of tartar emetic and one-quarter grain of opium every four hours; put the bird on soft, unstimulating diet.

Ulceration.

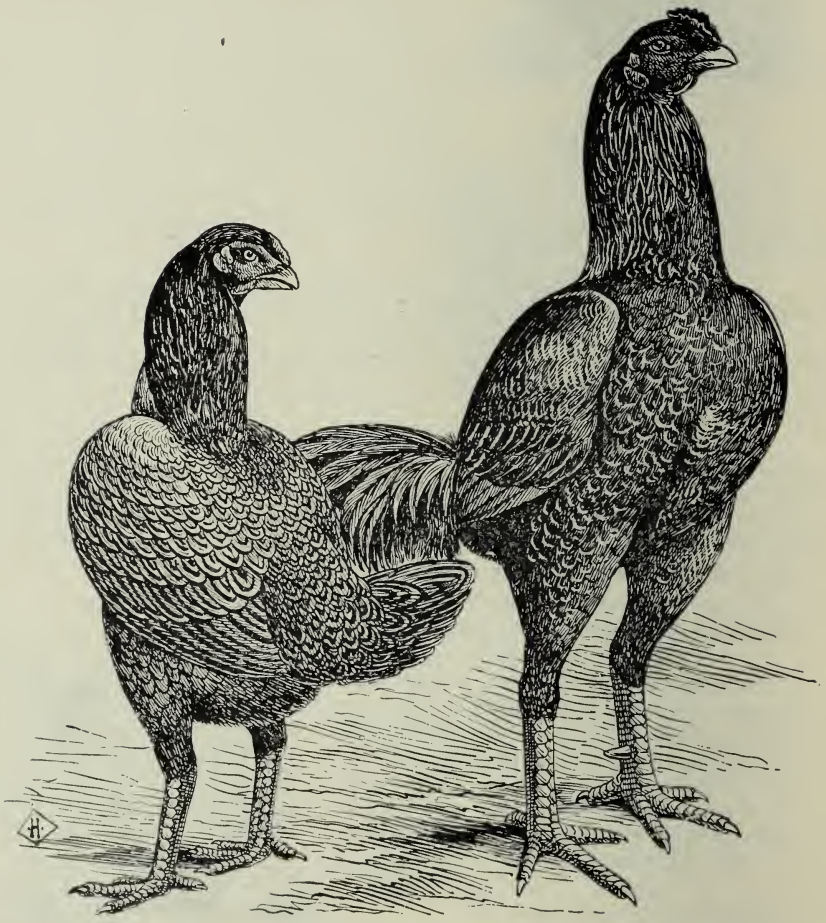
Symptoms. The symptoms of this disease bear a striking resemblance to aggravated cases of roup. It usually occurs about the head, commencing with a watery discharge from the eyes, which, by degrees, becomes of a firmer character and has an offensive odor, the nostrils being at first unaffected. The disease frequently extends to the throat, covering the back of the tongue with an ulcerous formation, and sometimes entirely fills the glottis and larynx with the diseased secretion, killing the fowl by suffocation. The cause is generally a severe cold or irritation.

Treatment. Make a dilution of four parts of water and one part of chlorinated soda or fluid carbonate, and wash the affected parts well with the mixture, and "swab" the throat and tongue, if affected, with the same.

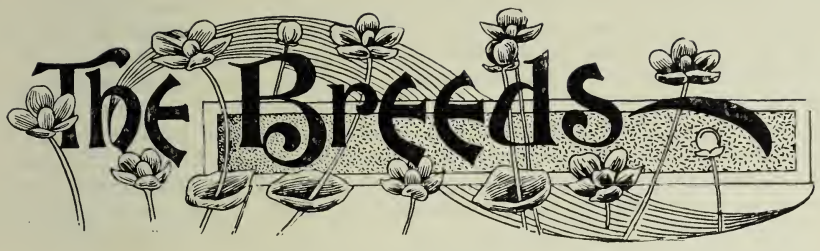


WHITE MINORCA HEN.

Worms. When fowls are troubled with worms, they may be the cause of many diseases. If their presence is suspected, examine the excretions, and if they are found, give a capsule of turpentine and a dose of castor oil. This will usually effect a cure immediately.



CORNISH INDIAN GAMES.



Origin of the Domestic Fowl.

Learned authorities differ somewhat on the history and origin of the domestic fowl. Charles Darwin, in his "Variations of Animals and Plants under Domestication," speaks on the subject as follows :

"The G. Bankiva has a much wider geographical range than either the G. Stanleyii, G. Sonnerattii or the G. Varius ; it inhabits Northern India as far west as the Sinde, and ascends the Himalaya to the height of four thousand feet ; it inhabits Burmah, the Malay Peninsula, the Indo-Chinese countries, the Phillipine Islands and the Malayan Archipelago, as far eastward as the Timor. This species varies considerably in the wild state. Mr. Blyth informs me that specimens, both male and female, brought from near the Himalaya, are rather paler colored than those from other parts of India, whilst those from the Malay Peninsula and Java are brighter colored than the Indian birds I have seen specimens from these countries, and the difference in tint in the hackles was conspicuous. The legs are leaden blue in the Indian, whereas they show some tendency to be yellowish in the Malayan and Java specimens.

"The wild G. Bankiva agree most closely with the Blackbreasted Red Game breed in coloring and in all other respects, except in being smaller, and in the tail being carried more horizontally. But the manner in which the tail is carried is highly variable in many of our breeds, for the tail slopes much in the Malays, is erect in the Games and some other breeds and is more than erect in the Dorkings, Bantams, etc. There is one other difference, namely, that in the G. Bankiva, according to Dr Blyth, the neck hackles when first moulted are replaced during two or three months, not with other hackles, as with our domestic poultry, but by short blackish feathers. Mr. Brent, however, has remarked that these black feathers remain in the wild bird after the development of the lower hackles and appear in the domestic bird at the same time with them.

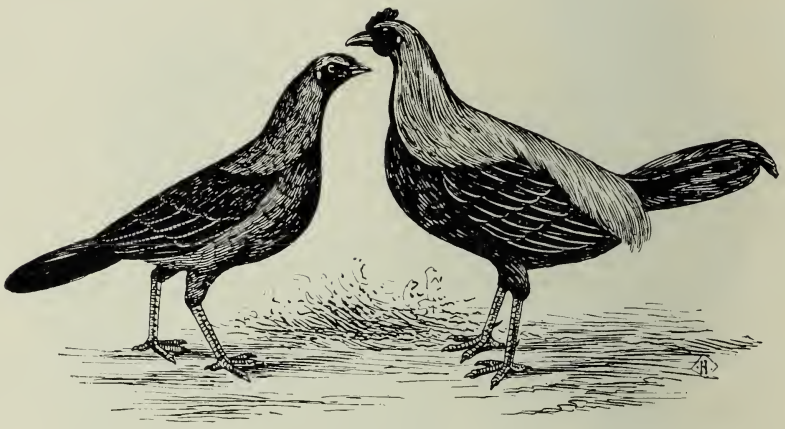
It is a significant fact that the voice of both male and female G Bankiva closely resembles the voice of the sex in the common domestic fowl, but the last note of the crow of the wild bird is rather less prolonged

"From the extremely close resemblance in color, general structure and especially in the voice, between Gallus Bankiva and the Game fowls from their fertility, as far as this has been ascertained, when crossed from the possibility of the wild specie being tamed, and from its varying in the wild state, we may confidently look at it as the parent of the most typical of the domestic breeds, namely, the Game fowl."

As regards the history of the fowl, Mr. Darwin continues as follows "Rutimeyer found no remains of the fowl in the ancient Swiss lake

dwellings. It is not mentioned in the Old Testament; nor is it figured on the old Egyptian monuments. It is not referred to by Homer nor Hesiod (about 900 B. C.); but it is mentioned by Theognis and Aristophanes between 400 and 500 B. C. It is figured on some of the Babylonian cylinders, between the sixth and seventh centuries, B. C., and on the Harpy Tomb in Lycia about 600 B. C., so that we may feel pretty confident that the fowl reached Europe somewhere near the sixth century, B. C. It had traveled still farther westward by the time of the Christian era, for it was found in Britain by Julius Caesar. In India it must have been domesticated when the Institutes of Manu were written ; that is, according to Sir W. Jones, 1200 B. C., but according to later authority of Mr. H. Wilson, only 800 B. C., for the domestic fowl is forbidden while the wild is permitted to be eaten."

Mr. Wright, in his book on poultry, speaks of the subject as follows: "We have on several occasions incidentally stated our opinion that more facts need to be ascertained before the question of the origin of the domestic fowl can be satisfactorily settled. It is well known, however,

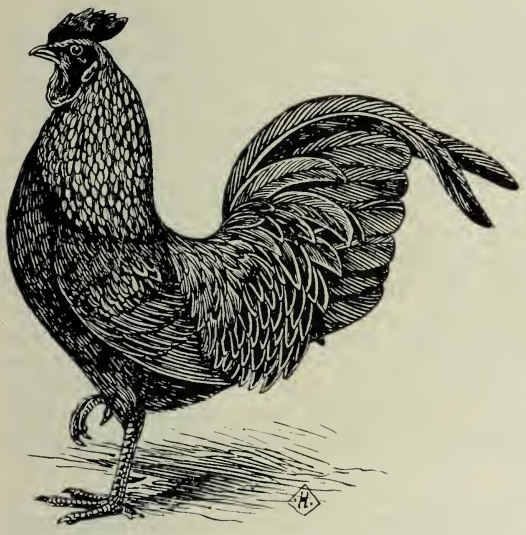


GALLUS BANKIVA.

that modern naturalists, among whom Mr. Darwin deserves special mention, believe that one existing wild variety known as the Gallus Bankiva, is the sole progenitor ; and we formerly accepted this view ourselves on what we supposed to be sufficient authority of such names, but have been gradually led to look upon it with the greatest distrust by facts which have since fallen under our observation, or been communicated to us by others in the course of an extensive correspondence upon poultry matters.

Continuing, Mr. Wright says : "The Gallus Sonnerattii is a very peculiar and apparently distinct variety. It is confined to the more southerly parts of India, among which, however, it is very common, and is known as the 'Jungle Cock' by Indian sportsmen. Col. Sykes says that it is very abundant in the woods of western Ghauts, and that it should be subdivided into two strongly marked varieties ; one of which, however, appears to be the Gallus Stanleyii, the cock having a great deal of red in the plumage, which the true Sonnerattii has not. This breed in general customs much more resembles the domestic fowls than

either of the preceding; it is larger, stronger and more powerful. It, however, differs in the hen being destitute of either comb or wattles,while the comb of the cock has only very fine serrations on the edge ; and still more in the peculiar character of the cock's hackles, the shafts of which expand at the tips into a flat and bony plate, which gleams in the sun. These plates are generally of golden orange color, but occasionally appear banded with various colors. The plumed portion of the hackle is dark grayish, the shafts being deep golden, which expands at the tip into the plate just described ; and not infrequently the hackles will show two such plates, the shaft of the feathers contracting after the first and then again expanding. The breast and back are generally a rich gray, verging into black or blue ; the tail black, brilliantly glossed with green, and the bill, legs and feet yellow. The hen is generally of a brown or partridge color on the upper parts, and grayish white on the breast, passing into almost pure white under the throat. The crow of the cock, it is agreed by all, differs somewhat from that of the ordiary fowl. Its crow is very peculiar, being a broken and imperfect kind of crow, impossible to describe."



GALLUS SONNERATTII.

The Gallus Stenleyii is generally stated to be peculiar to the island of Ceylon, but Mr. Trevor Dickens states that it is also met with over the southern slopes of the Ghauts, and in Java. It is very much like the G. Bankiva, except that the cock has a red or brown breast, and the comb is almost yellow, but with a red edge. The cock often crosses with domestic birds, but the hybrids thus produced are sterile. This variety has never yet been bred in confinement.

The male birds have orange-yellow hackles, a yellowish red breast, pink legs, and a beautiful bluish purple saddle. The hackle feathers are true hackle feathers and the saddle feathers are broad and rounded at the points, though exceedingly glossy. The comb is short and narrow at the base, expanding at the summit, and both it and the wattles are of the ordinary color, except that the comb is yellow in the center. The comb of the hen is very small and her plumage is plain, unobtrusive partridge color.

"The 'Javanese Jungle Fowl,' known as the Gallus Varius or Gallus Furcatus, or as the 'Forked Tail Cock," which is simply the last name translated, is in some respects a most peculiar and strongly marked bird. The comb of the cock is small and unserrated, is bluish at the base, changing to violet or purple at the edge. The head is rather long and narrow, the face being red and the eye very prominent. Under the

throat, in place of the usual double wattles, is a single wattle hanging from the median line of the lower mandible. The feathers of the neck are scarcely like hackles, but are blunt and rounded on the lower edge, being of a deep metallic green, bordered with black, and give much the effect of scales. The saddle feathers are of the same metallic green in the center, but are bordered with yellow; and the wing-bow feathers or shoulder-coverts are the same green, with golden green edges. The tail is glossy green-black, the two center feathers branching open, from which one of the names is derived.

"The hen is smaller, has no comb or wattles, and is of a generally grayish color underneath, with greenish hackles and gray, with a more brownish tinge over the upper parts of the body and the tail. The color of the legs seems to vary, the Antwerp specimens being of a flesh-color, while most of the Eastern sportsmen describe the color as blue or bluish gray."

Summing up the whole, Mr. Wright says: "It appears that the barrenness of the hybrids of the Gallus Sonnerattii is, at best, exceedingly doubtful, and disappearing in a great degree under more natural conditions; while peculiar traits quickly disappear, and the wild blood is rapidly absorbed into the domestic; we find also that the crow, although peculiar, is not so very unlike the Bantam's. We find further that the symptoms of reversion in the domestic breeds point to the color of this variety rather than to the one usually regarded as the parent. We find a strong tendency to approach more or less to every peculiar point of the Gallus Furcatus in a domestic Asiatic breed; while the latter breed also possesses a peculiar feature, the comb, to which other Asiatic breeds show a strong tendency still to revert. And in the Gallus Bankiva it is found that the voice differs in some degree; that it has a peculiar feature—the temporary black hackle—which only appears to be found in the domestic breed most closely resembling it, and not always even in that; whilst the perfect fertility of the hybrids still remains to be ascertained, and for all that appears is in no respect greater than that of the Sonnerat.

"What are we to suppose? That the Gallus Furcatus, for instance, was the progenitor of the Brahma, just as the Gallus Bankiva almost unquestionably was of the Game? By no means: no naturalist would come to any such conclusion. What we think is clear; is simply that there are tendencies in some of our domestic breeds which certainly are not due to the Gallus Bankiva, and which as they are found in the Gallus Furcatus, are probably the result of natural rather than artificial development; a conclusion which strengthened by the fact that another feature, Gallus Furcatus, not usually found in the domestic breed most resembling it, still appears, occasionally, by reversion, in that same breed.

"Hence we are disposed to think the original type can only be found still farther back; that it diverged into various sub-types, including the four wild breeds still known, and developed through the Gallus Bankiva into the Games, while other breeds were reached through the collateral branches, now either extinct or possibly still farther modified into the present other three known races."

AMERICAN CLASS.

PLYMOUTH ROCK, WYANDOTTE, JAVA, DOMINIQUE, JERSEY BLUE

Plymouth Rocks. This fowl has a national reputation. It enjoys a popularity which has been earned through the practical tests of many years' breeding, and it has firmly established itself in the American home to-day as the *beau ideal* of the feathered arena. We may even go further and say that the Plymouth Rock is the most popular fowl in the world for general purposes. Distinctly American in its origin, and being carefully bred under the same influence, it must be recognized as a leader in that class, and a standard by which others may be judged.

The early history of the Plymouth Rocks goes back a little over a quarter of a century; yet, some suppose from its exalted position that it is a fowl of many years' ancestry. Various bloods have been used in making the Plymouth Rock fowl, but the most reasonable belief is, that the bird originally came from the American Dominique crossed with the Black Java. Subsequently it has been shown that the Light Brahma, Dark Brahma and Pit Game have been used in its make up.

We quote extracts from an article by the Rev. H. S. Ramsdell, which was published in the *Pet Stock, Pigeon and Poultry Bulletin*, for March, 1873, as follows:

"Some thirty years since, John Giles, Esq., introduced a fowl into this vicinity called the Black Java; its plumage was black and glossy; its size large. It was an unusually hardy bird, with dark slate-colored, smooth legs, and the bottom of the foot yellow. It proved a good layer and of extra quality for the table. I sold a few of the birds to Mr. Thayer, of Pomfret, of whom Mr. George Clark, of Woodstock, Conn., purchased some. Mr. Clark, in passing Mr. Spaulding's yard one day, noticed a fine flock of Dominiques, and proposed bringing a few of his Javas over to cross with them, to increase the size. Mr. Spaulding accepted the offer, and when the chicks were grown he rejected the black ones and those with double combs, reserving to breed from only single-combed birds which retained the Dominique color, or near it. They were usually of darker plumage than the Dominique, the legs sometimes resembled the Javas—dark, with yellow feet—but were mostly yellow, or yellow with a slight streak of dark on the front of the leg, which, with the feet, were free from feathers. * * *

"We received some eggs from the cross from Mr. Spaulding as a present. We soon had a fine flock of them. * * * The fowls were soon spread around the neighborhood, and were much sought after, but they had no name. A gentleman asked me what I called them. Not knowing that any of Bennet's were now in existence—I had not seen any for years—I said 'Plymouth Rock.' The name passed from one to another, and they were soon generally known by that name."

In the above quotation it is plainly shown that our modern thoroughbred Plymouth Rock came originally from the crossing of two seemingly mongrel breeds. From the progeny of this cross, those which were more uniform in color were selected and bred from; this same method being repeated year after year until the zenith of ambition was reached in the type and style of bird of the present generation.

The Plymouth Rock is a fancier's fowl from an artistic point of view. Its fine symmetrical figure has grace in its every curve, and the upright carriage is of easy motion and well defined activity. In plumage one cannot fail to recognize the harmony of color, with the parallel bars of blue-black and white running evenly over the entire form of the fowl, reflecting in contrast to the surroundings a beauty that is distinct in itself, must necessarily meet with favor in the cynical eye. With the more practical—the farmer and the market poultryman—this bird is a great favorite, being of medium size, well proportioned, with a deep full breast, making a most admirable bird for market purposes. They are hardy, and mature early, making fine broilers from eight to twelve weeks of age. Under ordinary circumstances they lay well, and as winter layers there are few, if any, that can excel them. They are patient sitters and amicable mothers to their young, giving them the care and attention which maternal instincts prompt them to do. The many thousand birds raised annually testify to the popularity of the Plymouth Rock, and those who have had experience with them are loudest in the praise of the many good qualities which are embodied in this breed.

There are four varieties of the Plymouth Rock—the Barred, Buff, Pea Comb Barred and the White. In general character of outline, size and shape, they are identically the same bird; as regards the qualities, etc., the only traceable difference being in color. The variety of color and markings in the feathers is essential to please the varying impressions of the fancier's eye, and afford him a wider range to select that which pleases him the most, and at the same time giving him the distinct outlines and characteristics of the breed that comes nearest his fancy. Some may prefer the mellow tones of the rich buff, while others crave the pure, spotless white, and still others want the grayish white plumage of the barred variety.

In size the four varieties average the same, the weight of the cock being nine and one-half pounds, and the hen seven and one-half pounds; cockerels and pullets weigh a pound to a pound and a half less than the cock and hen.

The Barred Plymouth Rock is of a grayish-white color, regularly crossed with parallel bars of blue-black running in straight distinct lines throughout the entire length of the feather, and showing on the down or under-color of the feathers. The barring is somewhat smaller on the hackle and saddle feathers than on other portions of the body. The bird is of medium size, with broad neck, flat at the shoulders; the breast is full, and the body broad and compact; medium-sized wings, that fold gracefully, the points being well covered with breast and saddle feathers. A medium-sized head, ornamented with upright, bright-red comb and wattles, a large, bright eye, and yellow beak, legs and toes, places the picture before us in its entirety. The difference between the Barred and the Pea-comb Barred is that the latter has a small, firm and even pea-comb instead of single comb.

In the White Plymouth Rock the plumage is pure white throughout.

The Buff variety is colored a clear buff, uniform in shade, except the tail, which is deep buff, or copperish yellow-brown. In the Buff variety the color should extend to the under-color as much as possible, although a shade lighter is permissible for exhibition birds.

To breed the Barred variety successfully requires much study. It is an art to harmonize the color and produce the desired results. Keep always in view the preservation of the blue-bars, and make no sacrifice in breeding of this particular feature. The barrings of the feathers should be straight, running parallel at regular intervals down to the skin of the bird.

When mating for cockerels, a standard colored male, with a medium dark female, will produce the best results. Light cocks and dark hens produce prime pullets. In breeding it is best to use birds whose ancestors have bred true to feather, as chance birds are not likely to produce their like in their progeny; more satisfaction is to be had by using birds which have stood well in their class; the finer the cockerel the better the results. Good birds are sometimes had by mating a standard male to a standard female. From a single mating the writer once saw some very fine youngsters, and was told that this method of mating had always been employed by the breeder who owned them.

Wyandottes.

There are five standard varieties of Wyandottes—the Silver, Golden, White, Buff and Black.

Less than a quarter of a century ago this breed was first known in the State of New York. They were on first sight pronounced beautiful, their black and white plumage forming a decided and pleasing contrast. In disposition they were found to be docile; good layers, a good table fowl, and, in fact, a fine general purpose fowl. They were good sitters and mothers. These characteristics were commendable of the breed, and placed them in popular esteem at once. Through careful breeding, these points have been carefully developed, and this bird of mixed origin has risen from nothing, comparatively speaking, to one of the most popular and beautiful birds of American creation.

The speckled variety seems to have descended from several breeds, and no definite idea was at first advanced as to its origin. Through the knowledge of early breeders we are told that several well-known breeds are responsible for its origin. The three most prominent fowls used in making the Wyandottes are the Dark Brahmas, Silver Spangled Hamburgs, and the Bredas, or Guelders, a French fowl, which came originally from the feather-crested Polish family. Some authorities go even further, and say that the Wyandottes have Cochin blood in them, from the fact that at first their ancestors produced single combs and feathered legs.

As a fowl for fancy purposes, the Wyandottes have many admirers, and few classes outnumber this one at shows. For farm and market purposes they have few superiors, being excellent table fowls and prolific layers. The flesh is sweet, juicy and tender, making them favorites for roasters and broilers. As winter layers, they give a good return in eggs for the food consumed.

In color the Silver variety is, as the name implies, a silvery white, with regularly marked white lacing on breast. The cock has a silver-white head, rose comb, yellow legs (clear of feathers), silver hackle, with a black stripe down the feather; silver white back; saddle same as hackle; breast black, with white center, the center tapering to a point

near the extremity; tail black, wings composed of feathers half black and the other half white, or black edged with white; when the wing is folded there should be a well defined ring-bar across the wings.

The Golden variety is marked like the Silver, excepting that the color is golden bay and black instead of white and black.

Like the Silver Laced, the White Wyandotte holds an enviable position in the hearts of fanciers. They retain the fine qualities of the Silvers, being solidly built, compactly made, yellow legged, yellow skinned, with plumage that shows the pin feathers in the least manner. It is a beautiful fowl for the poultryman or fancier; its snow white plumage, with bright red comb, face and wattles, makes an interesting picture to behold. Its shanks are well formed and rich yellow in color, being free from all feathering.

The Buff and Blacks are not so popular as the two first mentioned. Being of recent introduction they have not yet become well known. In color the Buff Wyandotte is a clear buff throughout, except the tail, which is a deeper shade, or copperish brown.

The neck, back, saddle and coverts of the Black Wyandotte are of a rich black, with glossy green reflections, the breast, tail and fluff being pure black.

This breed is of medium weight—the cock weighing from eight to eight and a half pounds, and the hens about two pounds less. They are easily kept in confinement, and accept the situation quietly, without fretting or worrying.

The chicks of all the Wyandottes are hardy, grow rapidly and are good foragers.

They lay eggs of good size, about seven to the pound, which are of a creamy color, rich in flavor, usually fertile and hatch well. In confinement from six to eight hens should be put with a cock; not more, unless the runs are unusually large, as in too small an inclosure they do not exercise enough, and then the eggs are not as apt to be fertile. They commence to lay at about six months of age, and if hatched out in April or May will commence to lay in the fall and continue through the winter.

Javas. This variety of fowls is one of the oldest in the American class. They were exhibited at shows over half a century ago, and were at that time considered a very beautiful and valuable breed. For some unknown reason they are not so extensively bred to-day, nor are they as popular as they should be.

It was one of the breeds that was used in making the famous Plymouth Rocks. There are three kinds of Javas—the Black, Mottled and White.

In size they are between the Brahma and the Wyandotte, weighing about the same as the Plymouth Rocks. The cocks weigh about nine and one-half pounds; hens, six and one-half pounds. The plumage of the Black Javas is glossy black throughout; the comb is rather small and single, with well defined serrations. The back is broad; the breast, full and medium; the wings are of medium size. The shanks are black and the bottoms of the feet yellow.

The color of the Mottled Javas is an intermixture of black and white; and the White variety is a pure white throughout.

The Javas are layers of large, well flavored eggs, and as winter layers they do well, being large and heavily feathered. For the table they

afford nice eating, and make a good appearance when dressed for market. They mature early, are good sitters and mothers, and are easily kept in confinement.

Dominique. The American Dominique has long been before the poultry world as a favorite; its early history precedes the others of its class. The Dominique and Barred Plymouth Rock are similar in appearance, and to many unfamiliar with the breeds are often taken for the same fowl.

In size the Dominique is smaller than the Plymouth Rock, being about one pound lighter.

In color the Dominique is of a grayish-white, the feathers being crossed with the blue-black bars, giving the bird a bluish tinge. A neat rose comb, resembling that of the Hamburg; the face, wattles and deaf-ears are bright red in color; the shanks and toes are bright yellow. It is a neat-looking fowl, the color of the plumage not showing dirt as much as in some other breeds.

As a general-purpose fowl, the Dominique is to be recommended. It is an excellent layer; hardy, matures early and dresses well for the table.

In breeding select hens of a medium shade, and mate them with a cock slightly darker, avoiding birds of either red or black feathers.

Jersey Blues. The Jersey Blues are the least known of American varieties of poultry. They are one of the largest breeds we have, the cocks weighing ten pounds and the hens eight. They differ from others of their class in color of legs and toes, which are dark blue or slate colored. This, no doubt, keeps them from becoming a popular table fowl, as the American sentiment favors yellow skin and yellow shanks. As a breed, they are hardy and easily kept in confinement, and average well as layers.

In color of plumage they resemble the Andalusians, being, as their name implies, blue feathered throughout. Their breasts and fluffs are light blue. The hackle and back sickles are very dark blue, approaching black. They have a single comb and medium-sized wattles.



HEAD OF RED CAP.


WHITE CHINESE GOOSE.
TOULOUSE GOOSE.
SEBASTOPOL GEESE
GEESE
CANADA GOOSE.
A. HOWARD.

ASIATIC CLASS.

BRAHMA, COCHIN, LANGSHAN.

Brahmas. No fowl is more popular to-day than the Brahma. Its popularity dates back to the early ages of poultry raising, and amidst all the influences that have prevailed for other breeds the admirers of the Brahma have been the most enthusiastic. Its many qualities of excellence, its fine appearance, and the profit derived from them, have caused it to be termed the ideal and "all purpose fowl."

Its antecedents can be traced to the Gray Shanghais, which were large-boned, long-necked, and of large size. Many cocks have been known to weigh seventeen pounds. This is, of course, in excess of the standard weight of the breed, yet many have been exhibited which weighed from twelve to fifteen pounds. The standard weights are: Cock, twelve pounds; cockerel, ten pounds; hen, nine and one-half pounds, and pullet, eight pounds. It has frequently been urged to reduce the standard weight of the cocks two pounds, which would bring them close to the weight of the Plymouth Rocks. This reduction of weight would undoubtedly enhance the value of the breed, as it would mean quicker maturity, and this means quicker returns on the capital and labor invested.

There has been no change in shape or color of this breed since 1869; the standard has been the same, and all deviations from this have been caused by neglect or fancy of the individual breeder. Every breed has its own type, and the Brahma is more than characteristic in this regard, and is peculiarly different from any other breed.

The ideal birds shown in the cuts portray the typical Brahma, and clearly define the points of excellence in the fowl. The average well bred bird is in height 26 inches; back from the ground, 16 inches; keel from the ground, eight inches; length of body, front of breast to rear of fluff, 14 inches; height of tail, a trifle over 21 inches; saddle hangers, to rear of fluff, two and a quarter inches; eye, from tip of beak, two and one-sixth inches; length of head and beak, three and one half inches; breast, to rear of a drop line from point of beak, three-fourths to one and one-fourth inches. As specimens depart from this proportion, they become awkward and valueless as exhibition stock, and often also as egg producers.

The Light Brahma male is smooth in plumage of thighs, with close turned hock and properly feathered shanks and toes. Each lesser sickle reaches just even with and completely hides the tail proper. The slight concave line from point of keel bone to the front of thighs and the downward slope just in front of the hip joints, where the saddle commences and carries the concave line to the tail, are important features of the bird. Since the first adoption of the standard, there has been no deviation from the broad skull, overhanging brows, short, well-arched beak and the peculiar arch of the hackle and slope of the back; these are well defined, and are prominent features of the breed.

The oblong shape, full, broad and round breast, carried well forward, comes from the oval sweep at the throat to point of keel. This fullness and prominence gives the length of body, which is characteristic of prolific birds. The Light Brahma pullet shown in cut is in full development and devoid of fat. The curves of neck, back and breast of the Brahma are *fac-simile* in shape of the outlines of the eggs. If an egg was large enough, it would fit in the curve of the back of a pertect Brahma.

The Brahma hen has a broad, oval skull; heavy eyebrows, full throat, heavy, well-arched beak; the comb being smaller than the cock's. It's eyes are from pearl to red in color and masculine in appearance, which indicates great control and power. Prim shape of males and females are indications of fine breeds, and is encouraging for winners. Sacrifice symmetry for color only in the female, as it is impossible to obtain good shape from a poor-shaped sire. A sacrifice of color for shape in females should only be resorted to in order to restore shape to the females. The science of breeding comes from mating colors that vary from the requirements of the standard; to preserve the uniform color in mating is a study with charms; all aims should be exerted in careful mating and avoiding extremes. The perfect color in the male is a white neck, striped with intense black, with metallic luster for two-thirds of the length, and covering three-fifths of the surface of the web. The balance or under color of the feather may be black and white, resulting in white at the quill end in the upper part of the neck.

The surface color of the back should be white; the covered part of the web and fluff blueish-gray.

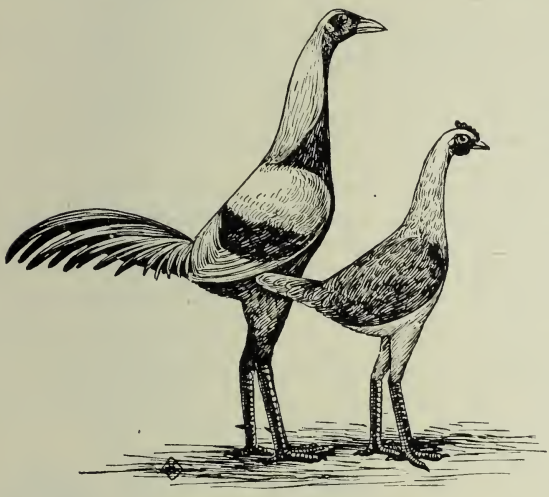
In the wings the primaries should be black or black and white, although fine specimens should be four-fifths black. The secondaries should be two-thirds white in the lower web, the shafts and the larger portion of the upper web should be black. The upper edge of the secondaries should be laced with white, the latter increasing in width as the feathers comb upward.

The tail proper, viewed from the rear is black, with curly feathers underneath black and white, shading into white as they near the fluff. The upper side of the tail should be black until it reaches the quill end, which is white, the white extending up the lower web from one to one and a half inches. The sickles, lesser sickles and side hangers and the first set of coverts (either one or two sets of them) black, laced with white, except white at the extreme quill end, which is normal to every feather of the Brahma.

The fluffs should have the bluish-gray tinge of the under color, with outer extremities white; shank feathers white, with black mottling near the feet.

The head of the pullet should be white, the neck plumage a black feather laced with white, the lacing narrowing toward the point, which gives the black centre a more pointed form than the outline of the feather. The fluffy quill end of the feather may fade to a white if the black retains a solid, metallic lustre two-thirds of the length of the web. The black will appear to cover also two-thirds of the surface of the web. The cape should be black and white, but completely covered by the hackle when the bird stands with head erect. A wholly white web should not be judged defective, but females with white capes seldom give a good percentage of prime males. The back should be pure white in surface color, bluish-gray in the under fluff. The entire

feathering of the back may be white and the bird can still be perfect as a breeder. The breast should be pure white ; wings, primaries, three-quarters black, with black quills, the white of a clear shade. Secondaries, two-thirds of lower web white, shaft with lower two-thirds of upper web black, the upper edge and about the point white, the lacing growing wider, the top feathers being entirely white. Tail, viewed from the under side, black ; the upper side black, except the two sickle feathers, which may be laced with white. The extreme quill end and up the lower web is white, the white extending up to one-half to one and a half inches. Tail coverts black, laced with white lesser coverts. The fluff is white ; shanks and foot feathering white. Black, mottled plumage should not be cut.



DUCKWING GAMES.

Thus we have a perfect Brahma and one which brings joy to the breeder and admiration from all who see them. Their noble bearing and fine appearance always calls praise from the most conservative person. No one can see a flock of Brahmas without admiring them ; and from egg to maturity its satisfaction to the raiser is well merited. It is profitable to the farmer both for eggs and broilers. The breeder recognizes its value and holds it as the favorite bird in his yards, while the fancier is fascinated with its supremacy over other varieties. All unite in saying the Brahma of to-day is a perfect bird, and its popularity never grows less.

The Dark Brahma.

The Dark Brahma, while not so popular, is equal to the Light Brahma in many particulars. The Light Brahma, on account of its color, makes a neater dressed fowl for the table, the white pin feathers being less conspicuous. It is more difficult to breed the Dark Brahma to the standard than the Light, as the sharp and distinct pencilings of the females and the black, full breast of the males are hard to preserve, except in the hands of a skillful breeder.

The head and neck of a Dark Brahma are very similar to the Light Brahma's, the head being white and the hackle rather more striped than in the Light variety. The back of cock is nearly white,a little black appearing here and there, while black should predominate between the shoulders, but is nearly hidden by the hackle flowing over it. The saddle feathers are, like the hackle, silvery white, striped with black, which should be distinct. As the feathers approach the tail, the stripes become broader, till they merge into the tail coverts, which are rich, glossy green black, with a margin or lacing of white. The tail is pure black, with green

gloss. The wing coverts are black, forming a distinct black bar across the middle of the wings, while the ends of the secondaries have a large black spot on the end, making the top edges of the wing appear almost black. The remainder of the secondaries are white on the lower half and black on the upper. The flights are all black, except a narrow fringe of white on the lower edge. The breast is black; the thighs and fluff either black or black very slightly mottled with white. The shank feathering should correspond with the breast, being black, if the latter be black, and slightly mottled with white, if not. The shanks are deep yellow, inclining to orange, but this rarely can be obtained except on a grass run. Many Brahmas being reared in confinement, it will answer if the legs be moderately yellow.

The color of the hens sometimes vary; it is generally a dingy, white ground, closely penciled with dark steel gray. This effect is beautiful, having a frosted or silvery-gray appearance, but there should be no show of pure white in the plumage except in the margins of the hackles. Unless extreme care be taken in mating, the hens are likely to have a dingy color, and the pullets are apt to have necks almost white for some distance down. These light necked birds generally breed worse and worse, but the evil may be remedied by choosing birds for breeding whose heads are distinctly marked. The shape and character of the markings of the Dark Brahma pullets also varies. They should be medium size, so that the pencilings can be clearly discerned at a distance of twelve feet. A great point in regard to color and marking in Brahma pullets is that it should be uniform over the body, and the hackles should be silvery white, heavily striped with rich black, and the shank feathering penciled same as body.

The size of the Brahma and the quality of the meat places the fowl well forward in the choice of table breeds. The legs are particularly juicy and tender, which is a good point in their favor.

The chicks are hardy and easily reared, and many broods are raised without the loss of a single chick. The competition of fanciers to breed for "feather" has interfered with the egg production of the Dark Brahma, but, as a whole, the result in this line is fairly good, and there are many flocks which are good layers.

Cochins.

The Cochin family hold a prominent place in the American poultry yard. They are, with the Brahmas, the heaviest of all breeds. The cocks weigh 11 pounds and the hens eight and one-half pounds. They are hardy, and in confinement will thrive and prosper. For winter layers they are excellent.

There are four varieties of the Cochin class—the Buff, Black, Partridge and White.

We quote Mr. Theodore Sternberg, an authority on breeding the Buff Cochin, as follows:

"In breeding Buffs it is not so very unusual to obtain pullets with clear wings and tails, but a male with both wings and tail perfectly clear buff is very rare, so rare indeed that such a one can be classed as an accident. One of our oldest Cochin fanciers who has bred them in America for 30 years says he never saw but one male with absolutely clear wings and tails. The reason of this is very plain. The dark and white blood is in the fowls, and it is very apt to crop out somewhere. If I were writing a standard for Buff Cochin males I would call for a clear buff tail, for this is a very great beauty and is very noticeable, but

I should not call for clear wings. I should permit dark in wings to go uncut and not call it a defect. Why? Because the color is in the blood—it is absolutely necessary that it should be in the blood or deep brilliant buff will be lost. It will break out somewhere, and it can be confined to the flight feathers and thus be concealed and not detract from the beauty of the plumage. I have seen in my life several males which filled this bill perfectly. Gorgeous buff plumes for the tail and all the dark out of sight in the wing flights.

"In making standards for fowls those things which are natural to the breed should be recognized. It is entirely wrong to make ideal standards which conflict with nature; breeders do not create colors. The best we can do is to some extent control the location of colors. In breeding Buff Cochins the breeder will select females as near as possible to the desired shade of buff, as free as possible from dark or white in wing and tail, and of as even a color as can be. The male for these females should not be the proper exhibition mate for them, but should, while of the same general shade, be two or more shades deeper in color. Considerable black in wing is quite the thing, while the tail should be buff of a coppery lustre.

"This mating should give many correct pullets and some fine cockerels, but for breeding cockerels I really prefer a pullet of almost cinnamon color, free from black in hackle, but with black in flights; some black in tail, although usually objectionable, is no serious matter. To such a pullet mate a male with clear buff tail quite light in color and some dark in flights. I have seen males with almost clear wings and tails of the brightest and most delicate shade from such a mating. This will be apt to give you some cockerels fit to use as males in the exhibition pen, but will not usually be so good as breeders at the head of a pen in the yard as the darker colored males. In short, as a rule I regard exhibition birds as not altogether the correct thing in the breeding yards when mated together. Color is far more easily gained if once lost than is shape. Shape is not only the chief element in beauty, but it typifies the breed. As between color and shape, shape is the most important, and should have a much higher value placed upon it when judging Cochins. Color can and does win in our average shows over shape and this ought not to be so. If I were called upon to judge Cochins I should endeavor to give the honors to the bird which is of the best and most typical shape, and if there were more than one typically shaped bird, then to the one which in addition to typical shape had the best color; birds not of the typical shape should be passed over as wrongly entered and not judged at all. I am one of those who believe that shape, like color, is a whole one



LIGHT BRAHMA COCK.

section to be looked at as a whole, and that there are but two sections in which it is according to all rules of art and of beauty proper to divide a fowl for the purpose of judging, viz : shape and color.

"The heavy leg and foot feathers which are characteristic of the true Buff need constant care in the breeding pen, or they will become less and less every year. The constant tendency is toward less and less feathers both in length and in quantity. While what is called a vulture hocked Cochin is not the exhibition Cochin, yet it is the source of all profusion of feathers. If a vulture hocked fowl were never bred from in this country at all, and no well feathered birds imported, it would not take ten years before all Cochins, still pure in blood, would lose their chief Cochin characteristics and become a short and hard feathered fowl, with only now and then a trace of feathers on the legs, and our magnificent Cochins would be no more. For this reason, and no other, I favor the removal of the vulture hock disqualification from the Standard, and would treat it as a defect when judging.'

The Partridge Cochin comes next in popularity to the Buff. The head of the Partridge Cochin cock is rich orange red, with a distinct black stripe down the middle of each feather. The color of the back, shoulder coverts and wing bow is a darker shade than the hackle, and the lower wing coverts are glossy black, with blue and green reflections. The primaries are black, with edging of rich brown on the lower edge ; the secondaries are black on the end, forming a black edge on the upper side of the wing butts, and the bay on the outer edges, and black on the inner. The breast, thighs, under parts, tail and leg feathers are rich black. The shanks are dusky yellow, and heavily feathered down the outer sides with black or brownish feathers. Single comb, yellow beak, clear bay eye, and bright red face are the features of the head. The plumage is light brown, each feather being penciled with dark brown ; the hackle is a rich gold color, striped down the middle with black.

Langshans.

The general favor in which this breed is held is well deserved. Among breeders and fanciers alike, it meets with approval as an all purpose bird, and one that is profitable to the keeper.

The Langshans are gentle in disposition, and bear confinement very well. They are hardy and remarkably free from disease, and the chicks grow very rapidly. They are more active than the other Asiatics, and the pullets commence laying at an early age, and are excellent winter layers. They lay a beautiful colored egg, often spotted or speckled, of good size and a delicious, rich flavor. They are classed among the largest breeds, the cocks weighing ten and the hens seven pounds. Their fine form and stately carriage meets with admiration from all, and as a table fowl there are few better, the meat being tender, with a splendid flavor.

There are two classes of the Langshan fowl—the Black and the White—one with a rich glossy metallic black plumage, with greenish reflections, and the other a pure and spotless white throughout. They have single combs, well rounded wattles, clear hazel eyes, which have an intelligent look, and a medium sized, rather broad head. The neck is well arched, with abundant hackle, flowing well over the shoulders; back is broad and breast round and full. The tail is very characteristic in the Langshan cock ; it is large and carried well up, with long flowing sickles extending well beyond the tail ; the coverts are abundant and long. The shanks are well feathered down the outer sides.

MEDITERRANEAN CLASS.

LEGHORN, MINORCA, ANDALUSIAN, SPANISH.

Leghorns. There is no doubt but that the Leghorn family is the most popular egg breed in America to-day. Look where you will, traces of this bird are found in divers ways, from the full-blooded variety to the Leghorn admixture of the dunghill fowl. This evidence of popularity is traceable to their prolific qualities as layers, and as the fact is established that the greatest profit of the poultryman is in the egg basket, little surprise, if any, is occasioned by the universal popularity the Leghorn family enjoys.

For eggs the Leghorn is correctly placed at the head of the list, and there is no especial difference in the prolificacy of the various types. Their non-sitting qualities further their laying qualities. Early hatched birds will begin laying in September or early October, and will lay through the fall and entire winter, if provided with moderately warm quarters. On this point may be reckoned the increase of profits for the year; when eggs are high, it pays to have hens lay. As winter layers, under the usual methods of housing, they are not considered the best; but when favorable conditions are provided them—that is, a warm house well protected from cold and wet—they will equal, if not surpass, any other breed.

Many suppose Leghorns do better when hatched late, because of their early maturing qualities. This is an erroneous supposition and should be corrected; pullets hatched late seldom lay before the following spring. April hatched birds will begin laying before cold weather sets in, and will continue through the entire season if made comfortable.

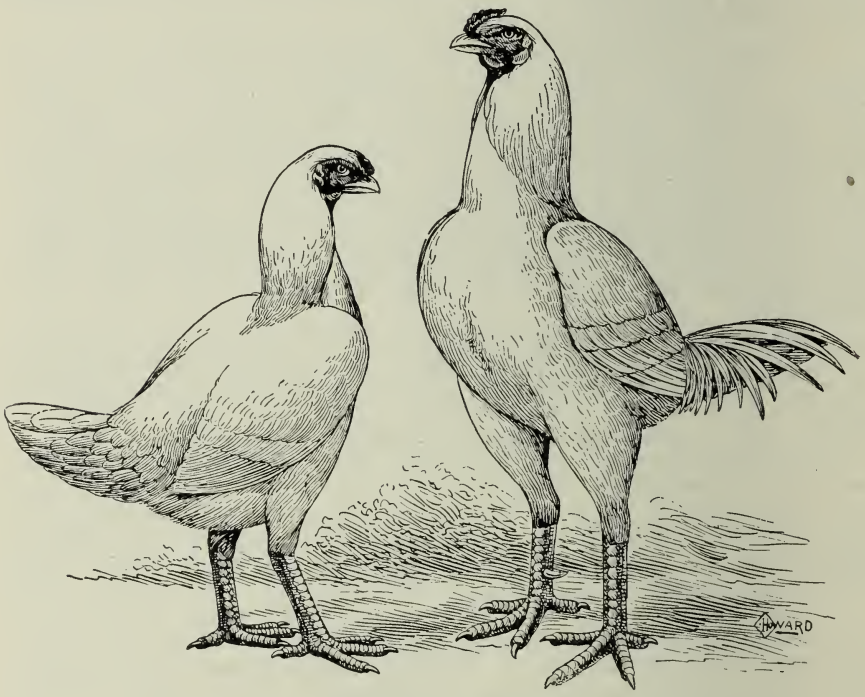
As a table fowl they are fair. While their small size may interfere with their classification as strictly table fowls, yet they may be considered profitable for market, as many people prefer two small fowls to one large one. Being active, good foragers and hardy, they can often be grown with less care and food than many of the larger breeds The flesh of the Leghorn is fine grained and of good flavor.

The Leghorn chicks will grow as rapidly as the larger breeds up to ten weeks old, and make plump broilers.

There are six varieties of the Leghorn type—the Brown, White, Black, Buff, Dominique and Silver Duckwing.

"In mating Brown Leghorns," says Mr. J. Forsyth, Owego, N. Y., "to produce exhibition birds, select a cockerel with a medium sized comb, fine in texture, firmly set upon the head, with five regular and even serrations, free from wrinkles at the beak; with large, solid white ear lobes, free from folds hackle, deep, rich bay, penciled with fine, intensely black stripe down the center of each feather, ending in sharp points; with dark under color, for white is a bad defect in otherwise good birds, and dark under color is one of the best precautions against its appearance; of standard figure, and in all other respects a standard bird. Place him with hens that were fine birds as pullets, and have preserved their characteristics after moulting, having a fine salmon breast, nice, rich golden hackle, with broad black stripe; well penciled

back; wings free from any tinge of red; fine, solid white earlobes, and combs that are rather above medium size. If the mating be made for pullets, the combs should fall gracefully to one side; if for cockerels, the combs should be semi-erect—that is, rising some distance above the head before beginning to turn over; even hens with perfectly erect combs are no disadvantage, as the cockerels bred from them will likely possess combs that are strong at the base and stand perfectly erect, with no inclination to lop to either side. This mating produces better exhibition birds than those bred from hens whose combs fold smoothly from the head. Such hens, too, will produce a fair percentage of good-combed cockerels when mated with a male that has a weak comb. The pullets from such hens, however, will likely inherit their characteristics, unless the cockerel should counteract it by having a comb which is weak at the base.



WHITE INDIAN GAMES.

"Females having very dark breasts, hackles which are smutty, dark brown or red in the wings, and generally very dark in color, may be mated to a male with a light bay hackle, the stripe of which is very narrow, and in color black or even dark brown, and is generally lighter in color than is required by the Leghorn standard.

"Females having a very light salmon colored breast, narrow stripe in the hackle, and otherwise present a faded appearance, may be mated to a male having a very dark hackle, with broad black stripe, very dark brown or red on back, and throughout a very dark bird.

"From the two last-named matings not a few good chicks will be produced, but the first mating is the one to be relied on where birds can

be had to make it. Not only will a larger percentage of standard birds result therefrom, but the chicks will be worth more for breeding stock on account of the law of reversion. Such breeding stock, if reversion takes place, produce admirable chicks, whereas, even finely marked chicks produced from the mating of the extremes of color, are liable to reproduce those extremes in their offspring."

In the Browns and Whites there are two sub-classes, which are distinguished by their single and rose combs; in the balance of the family the combs are single.

Among the Leghorn class the White variety is a close rival with the Brown for first choice. Mr. Joseph Wallace, in speaking of the Whites, says:

"It is generally conceded that the White Leghorns hold an advanced position for egg production. This is a well known fact to those who keep Leghorns, and that have experimented with other breeds. No other race of domestic fowls has given such an egg producing record; no fault can be found with their utility and beauty, though some of their admirers would wish they were larger in body, so as to complete their adaptation to table use and bring them in competition with Dominiques and the smaller sized Plymouth Rocks and Wyandottes. This is out of the question, if their natural prolificacy is to be retained. Selection of the best layers among the largest, best shaped and most robust specimens year after year would gradually increase their size, but the moment we suddenly increase the size of a breed beyond its natural capacity by a cross or overgrown specimens, it is at the expense of egg production, vivacity, and other natural leading characteristics.

"The Leghorn holds the same rank among poultry that the Jersey holds among cows. The question of profit has been settled in favor of egg producing breeds. There are scores of Leghorn breeders among farmers and cottagers who aver that they can raise fifty Leghorns as cheaply as thirty Asiatics, in the matter of food. The Leghorns are so lively that they will pick up a good part of their living during the year if they have liberty. They are the most active and industrious foragers known; they are easy to rear, feather quickly, lay early, and turn food into nice fresh eggs. No breed matures so early in life; the pullets often begin to lay when they reach their fourth month, and the cockerels crow and make love at two months old.

"All the Leghorn varieties should possess large red combs and wattles; white or cream colored earlobes; preference is given to a comb the tips of which describe an arch; the wattles pendulous, and if the edge folds a little it is preferable; earlobes should be smooth and even, and lie flat on the face; not kidney shaped nor too pointed, but the lower end maintaining gradual width toward the bottom. The Leghorn is a proud, shy, yet lively and attractive bird. The pleasing contrast between their pure white plumage, large facial appendages and pendent white earlobes give to the head a jaunty and coquettish 'set off.' Leghorns must be warmly housed in winter to save their combs and wattles. Those who breed for market should keep a flock of Leghorns for eggs. We cannot unite great egg producing qualities with prime table qualities in the same breed, that is, one breed cannot be pre-eminent in both and at the same time remarkably handsome."

The Black Leghorn is a popular bird; its rich, glossy black plumage makes it a desirable bird for the poultry yard. The only

objection that can be raised against the bird is the dark pin feathers, which, to some, are objectionable for table fowls, but aside from this the bird is in every respect the equal of the others.

The Dominique variety does not claim much favor. The color of its plumage is like that of the Barred Plymouth Rock and American Dominique, from which it derives its name. No better reason can be offered than that the Dominique has suffered, from the fancy point of view, from the popularity of the Barred Plymouth Rock, which displays the grandeur of the silvery white plumage to a better advantage than any other variety of this color of plumage.

The mania for Buffs is on the increase at this period, and this fact places the Buff Leghorn in great demand from an artistic or fancier's point of view. The clear, rich tones of buff are pleasing to the eye, and form a semi-tone between the extremes of light and dark feathers.

The contrast of colors is noticeable in the Duckwing Leghorn. In this bird the fancier finds a pretty effect of black and silvery white plumage. For some unknown reasons they are not as generally bred as the others of their class, but they ought to prove a very popular breed when better known.

Minorcas. The second of the Mediterranean class is the Minorcas. These fowls, to all appearances, are nearly the exact counterpart of the Leghorns. There are, however, differences between the two. The Minorca is larger in size, the standard weight for cocks being eight pounds and for hens six and one-half pounds. In shape the Minorca resembles the Dorking, but is not so square as the latter. The shanks of the Black Minorca are dark slate or nearly black, while the White variety has white or pinkish shanks. The shanks of the Leghorn are yellow. Another distinguishing mark between the two breeds is the comb, the comb of the Minorca being much larger than that of the Leghorn, though similar in shape and general appearance.

The comparison between the two is made because of the similarity of the breeds, and to trace in the one the many excellent qualities of the other.

The Minorcas are placed next to the Leghorns in prolificacy of egg production above all others. Their eggs are larger than the Leghorn, five having been known to weigh a pound. The two varieties of Minorcas—the Black and the White—are the same in plumage as the Black and White Leghorns.

Andalusians. The Andalusian is a handsome fowl, and is credited by some the hardiest of the Spanish breeds. The plumage is slaty blue, in many specimens slightly laced with a darker shade, but the neck, hackle and tail feathers are glossy black, ears white, and face red as in the Minorcas. The Andalusian chicks are hardy, and feather rapidly and well.

This breed should be more popular than it is, being very good layers of large white eggs. They, like the others of their class, are very prolific layers, and the eggs are considered of superior flavor.

As a table fowl, in this country they are not sought after, owing to the sentiment against white skin and blue shanks. English and French poultrymen admire these qualities in the bird, and with them the Andalusian appears to be well thought of.

As a fancier's fowl they have never attained the success wished for them, owing to the uncertainty in breeding true to color.

In general contour of body and appearance of head they resemble the Leghorns and Minorcas, having a large single comb, bright red wattles, and white earlobes.

Black Spanish. The Black Spanish is one of the oldest varieties of poultry, and is a descendant from the wild Gallus. Years before many of our now popular breeds existed, this breed was established, and its offspring are now scattered to the four quarters of the globe. The name Spanish has been linked with domestication from time immemorial, and few are there, indeed, who have heard the name of poultry but can connect the name of Spanish with it.

In speaking of this well known fowl, Mr. H. D. Kendal says:

"There is nothing that true fanciers so much admire as good blood. And here we find it pure, unalloyed for hundreds of years, a lineage as old as the proudest Hidalgo of his native Spain can boast, and above all of such prepotent force that their great merits and characteristic beauty have descended to us through generation and generation.

"In every feature is this breeding shown. Their haughty bearing, large red comb and wattles, the white face and lobes, peculiar to the variety, contrasting with their glossy black plumage, render them the most striking of domestic fowls, and we may truly add the most distinctively thoroughbred. To have appealed so far to the fancier's sentiment is enough to assure a careful hearing from those unfamiliar with the practical excellence of this breed.

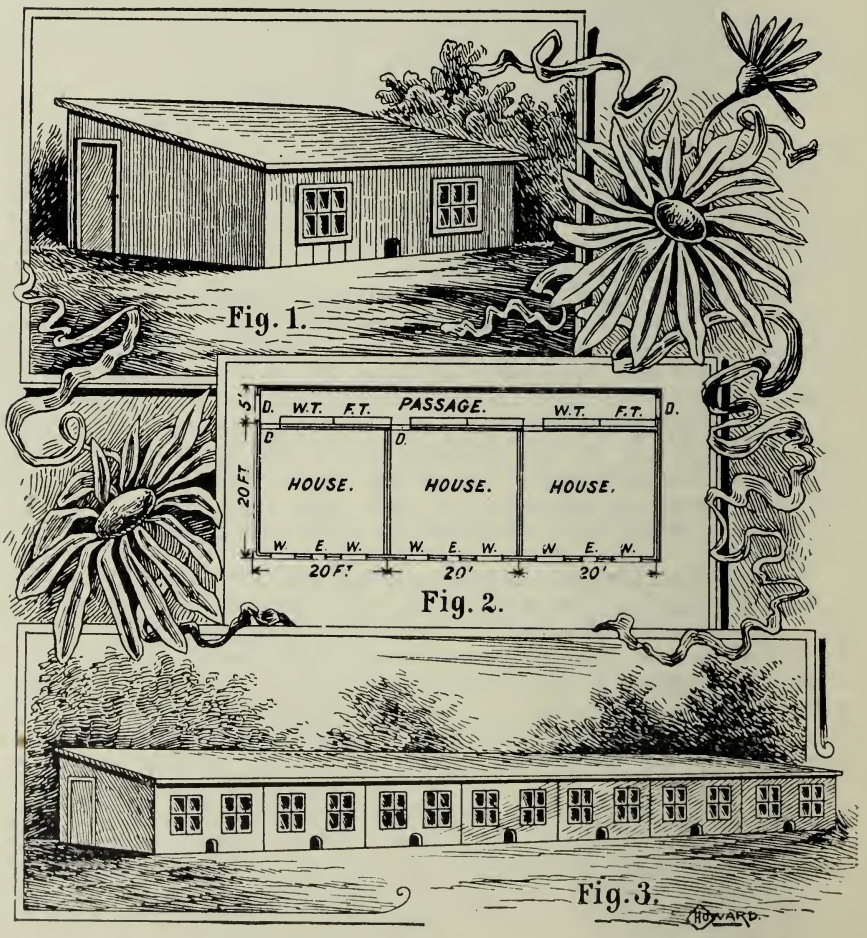
'White-faced Black Spanish have long been celebrated for exceptional laying qualities. The oldest of the non-sitting varieties, they still maintain an unsurpassed record—a record which, in consideration of size and quality with numbers, we might almost have pronounced unequalled. Pullets are early layers, averaging 170 to 190 eggs per year, the hens beginning somewhat later after moulting, but compensating for any loss of quantity by the increased size of the egg, while hens and pullets alike are well above the average winter production. To pass without comment the appearance of these eggs, large, white, and, above all, attractive, would leave unnoticed one of the strongest claims to popular favor.

"It is perhaps a surprising position to assume that the neglected Black Spanish is one of our best general purpose breeds, yet in view of these facts, such must be our opinion. I would not be understood as making this claim for other than the general fancier's or family purpose. Preeminently an egg-producing variety, they are less desirable in size, form and early maturity for market purposes than other breeds bred for that end, and as it is far better business to accept than oppose popular prejudice, large market producers should certainly raise yellow-legged and yellow-skinned birds.

"To secure excessive face development, vigor and utility have in many cases been sacrificed, and to this mistaken course may justly be laid the largely undeserved reputation for delicacy and unproductiveness, that has all but wrecked the once great popularity of this breed. The sooner breeders realize that this exaggerated development of one feature is a detriment to the whole, and that the production of such unevenly balanced monstrosities is a cause for regret rather than boast, the better for the Spanish interest in particular, and the entire poultry cause in general. From my own experience, I can affirm that with judicious care

and mating, Black Spanish will thrive with the same treatment required to assure success with any variety and with the protection necessary for any large combed birds in extreme cold weather.

"With the quick recognition of genuine merit, characteristic of American fanciers, there can be no doubt that a lack of accurate information and experience alone stands between this noble old breed and complete restoration to its rightful place in poultry interests, and that place is in the front rank."



POLISH CLASS.

WHITE CRESTED BLACK, GOLDEN, SILVER,
WHITE, BEARDED GOLDEN, BEARDED SILVER,
BEARDED WHITE, BUFF LACED.

The Polish is an old breed of fowls, and may be traced to the time of Ulysses Aldrooandi, a Bolognese gentleman, who was born in 1527 and died in 1605. He was an enthusiastic student of natural history, and devoted his time and means to collecting specimens and the payment of artists, engravers and publishers. During his life he published three folio volumes on birds. Among the varieties of fowls described by him was the "Wooly fowl," similar to the "Silky fowl" of to-day; the "Frizzled fowl," the "Persian fowl," the "Turkish," the Hamburgs, the "Feathered-legged fowl," the "Dwarf," a crested breed of various colors; the "Crested fowl," a white variety with a lark's crest; the "Padnan," or "Patavinian fowl." It is to the last that we trace the Polish fowl.

"There are a kind of gallinaceous birds," he says, "larger than ours, which are commonly called Patavinians. The cock is exceedingly beautiful, being richly decorated with five colors, viz, black, white, green, red and ochre; the body black, the neck covered with white feathers, and the wings and the back partly black and partly green; the tail of the same hue, but the roots of the feathers whitish, and some of the flight feathers also white. The eyes are surrounded with red circles, the comb is very small, the bill and feet yellow, and the head is adorned with a beautiful crest. In the hen there is no white, except the white pellicle at the opening of the ears. She is altogether of a greenish-black color, with yellow feet, and a very small comb, slightly tinged with red."

The tracing of a breed to its origin only affords a partial solution of the problem, yet we may accept the above quotations as an authority on the antecedents of the beautiful family of Polish which we have to-day.

Mr. Tegetmeir says: "There can be but little doubt that these birds (Paduans or Aldrovandus) were the progenitors of the present breed known as the Polands or Polish fowls."

He further declares that there is little or nothing known of the origin of the Polish, and the supposition that they are descendants of the great St. Jago cock is very unsatisfactory, "as there are more than twenty places in different quarters of the globe termed St. Jago."

The Poultry World in commenting on the subject, says: "While we may accept the Paduan fowls described by Aldrovandus, despite some not inconsiderable difference between them and the Polish fowls of the present day, as the probable ancestors of the beautiful crested varieties grouped together under the title of Polish, we need to receive with great care the supposition of early naturalists, like Cuvier, Buffon and Temminck, that the Paduan is descended from the *Gallus giganteus*, now supposed to have been the Malay, and not a wild species. The Polish fowls, it is true, may trace their ancestry back through the Paduan to the Malay and thence to the *Gallus Bankiva*, but we have not the

evidence to enable us to state positively that such is the fact. We have given the authorities, and leave the reader to cautiously draw his own inferences from them.

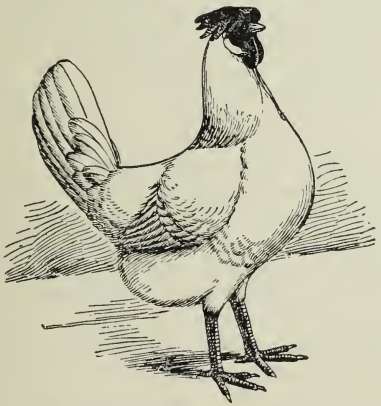
"But can we not learn something of the origin of these fowls from their name? May we not, at least, learn the country from which the English speaking people derived them? They are called Polish, and thirty years ago were commonly called Polands. Does not that indicate that they came from Poland? It would at first seem so, and no doubt many have so believed, but we are not to forget that the Hamburgs were not a native of that port whose name they bear, that the Cochin Chinas didn't come from Cochin China at all, and that the Brahma Pootras were not brought from the banks of that Indian river. Names are often misleading, and it is so in the case of the Polands or Polish. It is certain that they have no connection with the kingdom of Poland. It is not likely that they were imported from that country, but probably from Holland, for Mr. Beldon observes: 'In many pictures by the old masters —and especially those by Dutch and Flemish painters—the fowls depicted in their rural scenes are birds which, though not bred to feather as we breed them now, are unquestionably Polish fowls in all essential respects.'

"The general characteristics of the Polish are those of a medium-sized fowl, slightly larger than the Hamburgs; with a full round breast, carried well forward; with the neck in the cock carried back, somewhat like that of a Fantail pigeon, and beautifully arched; with a perfectly straight back, broad at the shoulders and narrowing rapidly to the tail; with large and closely-folded wings; with a large, well-expanded, upright tail, and in the cock furnished with an abundance of tail coverts and sickle feathers; with shanks of a bluish color, in all varieties but the White-crested Black, in which they are of dark slate or nearly black color; and above all with a large crest and peculiar comb. The crest of the cock is composed of narrow feathers, something like those which form the hackle of the neck and saddle. They should rise well in front, so as not to obstruct the sight, and fall over to the back and sides in a flowing, even mass. If they fall forward, which is sometimes the case, they both obstruct the sight and are liable to get wet when the bird drinks. Such a crest, also, is hollow in the center, and loses much of its beauty. The crest of the hen is formed of feathers growing upward and turning in at the extremities, and should be large and globular in form, and compact in character, with no sign of parting. The larger the crest, the better, provided it is of good shape, but a close, compact, well-formed crest is to be preferred to one that is larger but of loose texture and falling in all directions. The comb is peculiar and belongs to the class of combs which, from a fancied resemblance to a leaf, are designated leaf-combs. It is far better described, however, as two fleshy horns diverging like the letter V, the upper extremities retreating into the crest. The smaller the comb, the better, and if wholly wanting, except when removed by design or accident, it is not regarded as a disqualification."

The Polish fowls are divided into two classes, the Bearded and Unbearded, the former being more popular.

The Polish fowl is a very useful bird for the breeder and the fancier. Aside from their strange beauty, they are considered a general purpose fowl. Col. R. J. Hamilton, the veteran breeder of Polish fowls gives the qualities of the bird as follows:

"They are hardy, good layers and excellent fowls for the table. They are of medium size, slightly larger than the Hamburgs, with a full round breast, carried well forward. Their backs are perfectly straight, broad at the shoulders and narrowing at the tail, which is upright and well expanded. The crest of the cock is composed of narrow feathers something like those which form the hackle of the neck and saddle. These should rise well in front, so as not to obstruct the sight, and fall over the backs and sides in a flowing mass. The crest of the hen is formed of feathers growing upward and turning in at the extremities, and should be large and globular in form and compact in character, with no sign of parting. In color the Black Polish is a deep black throughout, except in the crest, which is pure white. The combs are small and are V shaped, the upper part retreating into the crest." Continuing, the Colonel says: "The White Crested Bearded Polish, though of uniform white plumage throughout, have the same erect and strutting carriage which characterizes the Polish class. The color makes them attractive, and in appearance they are as neat and aristocratic as any fowls ever placed on exhibition. They attract attention wherever shown, and are favorites with ladies. Their plumage is pure and white as snow, which necessitates great care and attention to preserve beauty. They must be kept perfectly dry and clean, as their beauty depends upon the delicacy of their plumage and the cleanliness of their appearance. Attention must be given to the preservation of their beard and crest, and a covered water fountain should be provided for them. To those persons who desire to keep fowls and have only a limited place for them, this breed is especially adapted. They will make nice pets under proper treatment, and will in a short time become the admiration of the entire household. They lay well under favorable conditions, but are non-sitters. The chicks require attention and care, the dryness of the coop being the greatest importance. If it is your purpose to keep pets, no fowl is better suited for that purpose than this breed, but the success of the breeder or fancier depends largely on his attention to their wants."



WHITE LEGHORN HEN.

HAMBURG CLASS.

HAMBURGS, RED CAPS, GAMPINES.

The Hamburgs are deserving of special attention both from fanciers and from practical poultrymen. The Spangled variety is given the preference, both for its beauty and hardiness. They have also the merit —unlike the Penciled variety, which is purely ornamental—of being economical fowls to keep, for they are prolific layers, great foragers, and with the Black Hamburgs easily stand at the head for fecundity. Were it not that their eggs are rather small in size they would be far more popular with those who have produce for sale, but at present their eggs are, as a rule, rather below the requirements of the market. So far as the breeder is concerned, they are the most economical fowl, for they are very small eaters and hence they are most profitable to keep. By the exercise of a little care in selection of breeding stock, the size of the eggs could be enlarged. There are some which lay larger eggs than others, and if more attention were given to the size of eggs it could soon be remedied.

There are now six varieties—the Silver Spangled, Golden Spangled, Silver and Golden Penciled, and the Black and White.

The Silver Spangled seems to be the favorite among fanciers. Their proud carriage, their royal decoration, and graceful and symmetrical forms, command attention in the show room or on the lawn in the breeder's yard. They are non-sitters, prolific layers, small feeders, fair size and most delicious table fowls. As chicks they mature early, and the pullets begin to lay when six months old.

The Silver Spangled is the best known breed in the land. To the Yorkshires and Lancashires they owe their present state of perfection, although American breeders have done more in twenty years to perfect their combs, earlobes and faces than the English fanciers have been able to accomplish in double that time. The plumage is English, and to English fanciers is due the credit of perfecting their beautiful markings. When poultry shows first came into fashion, their "moon eyes" received the largest share of awards at all exhibitions, until it came to be considered utter foolishness to show any fowl against them. They enjoyed this exalted position for several years, so that the Hamburg has a long record.

The breeders of Hamburgs universally adopt the following as a standard for the breed: Comb square at front, tapering nicely into a long spike, full of points, by no means plain, firmly and evenly set on the head; face red; earlobes moderate size, round as possible, and clear white; legs leaden blue; carriage graceful; plumage very profuse.

Color—Cocks, Silver Spangled: Clear silvery white ground, every feather tipped or spangled, the breast as bold as possible, but showing the spangle, the bars of the wing regular and bold; neck, back and saddle nicely tipped; bow well marked (by no means cloudy, brown or brassy); back as green as possible. Golden Spangled: Color very black and rich, the back glossy green; the neck, back and saddle nicely striped; bow of wing well marked.

Hens—Silver Spangled: The white clear and silvery; the spangles large, green as possible, distinct and clear. Golden Spangled: Ground rich, clear spangles, large and distinct.

Red Caps. These fowls are among the oldest we have. They are spoken of by old authors as a breed of the family of Hamburgs, as a sort of mongrel Golden Spangled, with immense rose combs.

The Red Caps are not widely known to-day; they are not so popular as the others of their class. Being nearly similar to the Hamburgs, those who like this style of beauty in fowls naturally take to the trim and sprightly Hamburgs.

In size the Red Caps come under the middle class of fowls—above the size of the Minorcas. The cocks weigh seven and one-half pounds and the hens six and one-half pounds. They have a large rose comb, which their name signifies. In plumage they are a red and black; the head is red, with blue black hackle, each feather being edged with red; back is red and black, and breast is purplish black. The shanks are slate colored.

They are hardy and mature early, and, like the Hamburgs, are excellent layers. For market purposes they are good, the size and quality of flesh being recommendations for popular favor. They are reputed to be non-sitters. though frequent incidents are known of their sitting and hatching broods.

Campines. The latest addition to the standard of the Hamburg family is the Campines. These fowls have recently been introduced to the American poultrymen, and from experiences of those who have bred them, they should prove a worthy rival of the other varieties of their class. In an article written by Mr. Henry Hales, the history and characteristics of the breed are told as follows :

"Taking up my pen to describe Campines, revives old memories. They are the ancestral bottom stock of many varieties of poultry ; I know of no other breed that can claim such a numerous progeny. After a number of variously named varieties have descended from them by selection, the same old pure breed has been preserved in their native Belgium for over a century. Previous to their breeding up to the Hamburgs, there were several varieties of fowls called Creoles. Bolton Grays, etc., quite often met with in America ; they were all of the same stock but not so closely defined in marking as the Hamburgs of to-day. I well remember seeing them.

"The first notice we have in English literature, that I have seen of them, is in Mawbray's Domestic Poultry, London, 1828, which says : "There is a small variety now imported from Holland called 'Every Day Hens,' which are everlasting layers." Notice the name, which has been retained to the Campines on their native soil to the present day. These fowls were, no doubt, the ancestors of the several varieties called under different names, as they were bred over the north of England, with little changes in some localities, where the whim or the taste of the breeders influenced them, as a little later on we hear of Bolton Grays, Creoles, Lancashire Mooneys, Chilliprats, and several other names. These found their way to America.

"For a full, interesting account of the development of this breed into the Hamburgs, one should read the graphic description in "Orna-

mental and Domestic Poultry," by the Rev. Edmund Saul Dixon, M. A., England, revised fourth edition by J. J. Kerr, Philadelphia, 1855. The original edition was published several years earlier, as it is quoted from by Bement, and was the next we hear of our poultry after Mawbray. This work has a fair picture of Creoles or Bolton Grays with rose combs, the markings. Another name for the improved Campines was Pheasant Fowls, Gold and Silver.

"Bement's American Poulterer's Companion, New York, 1845, quotes Mawbray, and Dr. Rufus King, of Portsmouth, N. H., who, seeing an account of the fowls in the New England Farmer, Vol. XVIII., Nos. 39 and 43, procured two from Philadelphia ; he goes on to describe them in the same fashion as others, and adds : 'They are a hardy fowl, and I value them most of any I have.'

"Records show they were the first breeds (varieties) that started and graced poultry exhibitions and were awarded premiums. Later the Hamburgs took their place in the show room, but their ancestral home kept on with the same style birds, so well represented in the accompanying illustration.

Now I have gone through all this to show what the Campines are. It is hardly correct to call them Single Combed Hamburgs, as they have either in Belgium, single or double ; nor is it more correct to call them a new breed, as they are one of the oldest. I have known them as long as I can remember a fowl. I do not believe in calling their descendant varieties *improvements*, that is more a matter of fancy than usefulness. They are beautiful fowls and what is a most important fact, every account of them, from the earliest to the latest times, agrees on one point—their extraordinary laying qualities. But it must be borne in mind their early records were light compared with the present time, yet at that time they compared favorably with other poultry of that date. As to admitting them into the American Standard, I do not think one-half of the admitted breeds can lay as good a claim to that honor ; there is more distinction between them and Hamburgs than there is between some other allied varieties in the Standard. The marking of the cock has neither the white breast and wings of the Silver Penciled, nor the bars of the Spangled Hamburgs, nor the rose comb of either. Since Dixon's time, some have doubted whether the Spangled Hamburgs have the same origin as the penciled birds. I do not see why this is doubted, for Dixon was a great naturalist as well as poultry fancier, and his writings show he gave the subject careful attention.

"It is not necessary to breed and show these birds several years in America to prove them worthy of our Standard, any more than it is to breed our Plymouth Rocks to prove them in Europe. They have already a long national reputation that few fowls can claim.

FRENCH CLASS.

HOUDANS, CREVE COEURS, LA FLECHE.

Houdans. Of the French breeds, the Houdans are the most popular, the general indorsement which they are receiving fully testifying to their merits. They are bred extensively in America; and they are recognized as a profitable adjunct to the poultry yard. They are medium size, with comb and crest, and in color are mottled, with black and white, the black predominating.

They are hardy, and prolific layers of large white eggs; for table purposes they are among the best fowls. They have small bones, and the flesh is tender and delicious.

The chicks are sprightly, active and feather rapidly. They are non-sitters and light feeders—like the Leghorns, they may be fed at a small cost as compared with some of the larger breeds.

For the fancier they may be styled an ornamental fowl. They are upright in carriage and of strutting or pompous inclinations, their large black and white crest and peculiar comb make a striking picture for the poultry yard.

Another peculiarity of the breed is that, like the Dorkings, they have five toes; while of no seeming use whatever, it is a requirement which is important in the breeding bird.

There is no doubt that the Houdans are of value to the poultryman for practical and fancy purposes alike, and should be recognized as a general all-purpose fowl.

Creve Cœurs. The Creve Cœurs are not so well known as the Houdans in this country, but in France they are held in high esteem for the delicacy of their flesh.

The Creve Cœurs are large, the cocks weighing from eight to ten pounds; in color of plumage they are black with greenish reflections. Their shanks are very short, so much so that they may be styled "creepers" in this respect. They have a large crest and a leaf comb, resembling the letter V; the wattles are nearly concealed by a thick beard, which extends to the back of the eyes almost hiding the face.

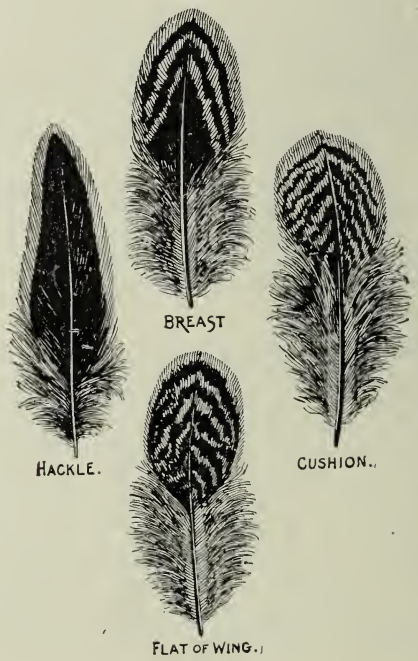
They are gentle in disposition and easy to confine, but have a weak constitution, which necessitates extra care in raising. They are only medium as layers, and are non-sitters Their stronghold is for the table. and in this respect they rank very high.

La Fleche. Among the French breeds the La Fleche is the least common, owing to their extremely delicate constitution. Mr. Wright, in speaking of them, says:

"This breed differs considerably from the Houdans and Creve Cœurs. The latter birds are compact and neat in frame, while the La Fleche is high and rather gaunt looking, the whole frame and character of plumage denoting the preponderating of Spanish blood. That a Polish cross was also employed is, however, conclusively proven by the fact that nearly all the specimens first imported had a small crest, while the signs of the cross are still apparent in the small two-horned comb. The

La Fleche is a very tall Spanish-looking fowl, with red face, brilliant white ear lobes, and glossy black plumage.

"The flesh of the fowl is more delicate and juicy than any variety except the Game; it is a moderate layer of very large white eggs, but by no means so good as the Spanish in this respect; it is as a table fowl that it claims superiority. It does not mature early—not nearly so early as the Houdans or the Creve."



ENGLISH CLASS.

WHITE DORKINGS, SILVER GRAY, COLORED DORKINGS.

The Dorking is one of the oldest of the domestic fowls, if not the oldest. There are no definite records to show when it first lived in England, or from whence it came. But the supposition is that it was carried to England by the Romans, who evidently possessed fowls of similar characteristics. The following quotation from Moubray is a resume of its history :

"It is undoubtedly a breed of great antiquity, having been noticed and described in the first century of the Christian era by Columella and Pliny ; and there seems fair grounds for supposing that these birds were introduced into this country by the Romans, among whom they had attained at that early period, some celebrity, and were much esteemed ; with us but few fowls can boast such high and long continued reputation as the Dorkings. It has been suggested that Shakespeare was acquainted with the superior qualities of these fowls, and that he alludes to them in his Henry IV., when he makes Justice Shallow, of Glos'ter, order 'a couple of short-legged hens' for his guest's repast. The chief distinctive mark or characteristic of the breed is the presence of a fifth, or supernumerary toe, springing behind, a little above the foot and below the spur. It has been sought by various writers to deprive Dorking of the honor of being the original and principal rearing place of this justly celebrated variety ; and it is asserted that the true Dorking fowls are raised at Horsham, Cuckfield, and other places in the Weald of Surrey ; and that the ancient and superior white fowls from Dorking are a degenerated race compared with the 'improved' Sussex breed."

This English bird is one which may be considered an ideal bird for general purposes ; it is medium size, cocks weighing seven and one-half pounds, and the hens about six pounds. It is a hardy fowl and can stand almost any amount of cold weather, providing that the ground is not damp. This is proven by the fact that they do well in the northern part of Scotland, and in the extreme north of Ireland among the Cumberland Hills, and in other places equally as cold and exposed. This should be remembered by those who contemplate raising them, that the soil must not be damp, if success be expected with them.

As layers the Dorkings are good, and are careful sitters and attentive mothers.

The feature in which the bird is most popular is its table qualities. The flesh is white and very delicate in texture. It is claimed by many to equal, if not excel, the French varieties—the La Bresse and La Fleche. The broad, deep and projecting breast of the Dorking admirably fits it for table purposes, and in this respect it is conceded the rival of the Indian Games.

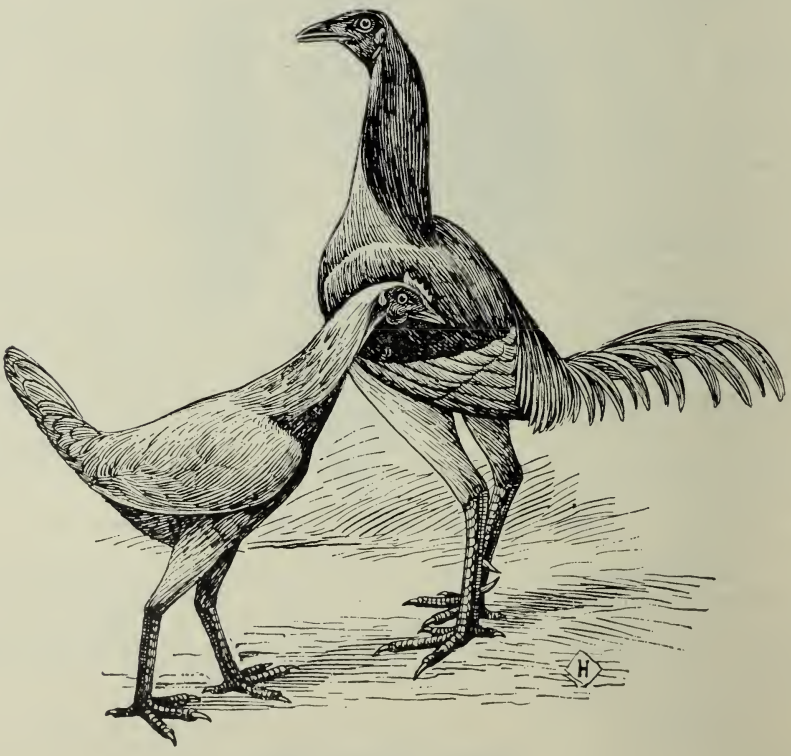
The White Dorking is really the purest blooded of the three, as for years this was the only variety which produced invariably the fifth toe ; although the Colored and Silver Gray varieties seldom fail to breed this peculiarity.

In color the White Dorking is of clear, unblemished, glossy white. The comb and wattles are a bright, scarlet red; the legs are either white or a delicate flesh color.

The following are the points of the Silver Gray Dorkings:

Cock.—Head, silvery white; hackle, pure silvery white, as free from stripes as possible; comb, face, earlobes and wattles, bright red; beak, horn or white; eye, orange; breast, thigh and under parts, black; back, shoulder coverts, saddle and wing-bow, pure silvery white; coverts, greenish black; primaries, black, edged with white; secondaries, part of outer web forming "Wing bay" white; remainder of feathers forming wing butt, black; tail, greenish, glossy black; legs, feet and toe nails, white.

Hen.—Eye, beak, comb, face, wattles, legs, feet and toe nails, same as in cock; head, silvery white, with slight gray markings; hackle, silvery white, clearly striped with black; breast, rich robin-red or salmon-red; shading off to grey in the lower parts; back, shoulder coverts, saddle, wing-bow, and wing coverts, bright silver grey, with minute pencilings of darker grey on each feather; the shafts of the feathers, white; primaries, grey or black; secondaries, grey; tail, grey, of a darker shade than body: quill feathers, black.



PAIR RED PILE GAMES.

Games and Game Bantam Class.

BLACK BREASTED RED, BROWN RED, GOLDEN AND SILVER DUCKWING, RED PILE, WHITE, BLACK, BIRCHEN, CORNISH INDIAN GAME, MALAY.

The Game Fowl.

The origin of the domestic fowl has been thoroughly discussed in the beginning of this book. From the writings of well known and learned authors on these topics it is universally conceded that the Games are the descendants of the ancient Gallus Bankiva. The resemblance of the Game to the wild bird in figure and in color, markings and characteristics, is so close as to scarcely permit of a different conclusion. The Bankiva cock resembles a small Black Breasted Red Game in shape and color and in size is between the Game and Game Bantam.

In speaking of the Game fowls, Mr. H. S. Babcock says :

"The Game fowl has a long and interesting history, though it takes us back to the time when the chief value of the fowl was its individual courage and its chief use was found in the cock pit.

"The Exhibition Game, with whose description we are alone concerned, is derived from the Pit fowl, and the great difference in type between the two birds is evidence of the remarkable skill of the poultry breeder in fashioning the plastic form of the fowl to meet the fancy of his mind. It is also evidence of the remarkable variation that is inherent in fowls, which enables them to be molded at will. The Exhibition Game, however, has not been changed to its present figure without a suspicion of crossing, and it is generally believed that Malay blood has been judiciously used in its formation. It is true that certain writers assert that the Black-breasted Red Game is the most thoroughbred of all fowls and imply that no crossing has ever been resorted to, but the evidence in the shape and the disposition is so strong that most of the best informed breeders believe that the reachiness of the modern Game is due quite as much to a cross with the tall Malay as to the skillful use of selection. In the opinion of this writer both crossing and selection were necessary to effect so great a transformation as that of the Exhibition Game from the Pit fowl.

"The Pit Game is a fowl with only a moderate length of limb, with a rather low carriage for a Game fowl, with rather long and soft plumage, and with a big bushy tail carried well up. The Exhibition Game, on the other hand, has very long legs and neck, stands very erectly, has short and hard plumage, and has a small, closely folded tail carried at a very moderate elevation. The birds are very unlike each other, and it is safe to say that there is, in appearance, a greater difference between an Exhibition and a Pit Game than there is between an Exhibition Game and a Malay. The latter has the length of limb and neck, the short and hard plumage and the closely folded drooping tail that are so much admired in the Exhibition Game."

By careful selection for many generations, the Exhibition Game has been brought to its high state of perfection. For beauty the Game is considered to be the beau ideal of the feathered race ; although some

fail to trace the slightest favor with the tall figure of the Game fowl. Each individual taste and the taste of nations differ in respect to the term of beauty, and that which is considered beautiful by one is the reverse to another. The small foot of the Chinese woman is the ideal of beauty to the Chinese nation; the fatter the woman the more beautiful she is to the Hottentot fancy; the blacker the skin of the negress, the greater is her beauty admired by the nations of Africa. These reflections show the diverse opinions of humanity, and are not cited as apologies for those who do not see the strange and fascinating beauty of the Exhibition Game, as it is bred to-day.

Its tall, commanding and striking figure is a decided contrast to the figures of other poultry, and affords relief to those who are weary of the sameness of many of the birds in the show room, and wins admiration from all who see them.

Black Breasted Red Game.

In the Game class, as well as in other of the numerous classes of thoroughbred poultry, the history of the Black Breasted Red dates from the most remote times. They breed uniformly and invariably alike in color, and in the Bantams of this name, which have been bred down from the Game, the same uniformity is still observed.

The head of the Red Game cock is long; neck is slim and snaky; broad breast; prominent wing points; great breadth across the shoulders; a straight back sloping to the tail, narrowing from the shoulder to the stern; a short wing; a hard, compact body; a closely tucked-up stern; a long, well-developed thigh; a long, smoothly-scaled, stout shank; long, straight toes; and a small, closely-folded tail, having few sickles and hangers that are fine and narrow. The hen is about the same shape as the cock, and both have an upright and bold carriage.

In color the Red Game cock is a bright orange, or light red on head, hackle and saddle; the breast, body and stern are black; the shoulders, except the shoulder coverts, are red; the bow of the wing is red; the coverts black; the feathers of the tail, sickles and tail coverts are a lustrous black; the thighs are black, and the shanks and feet yellow.

The hen is brown; the head and hackles are light golden, with feathers of hackle striped with black down the center. The brown coloring of the feathers of the body are penciled with black; the tail may be black or dark brown; the upper feathers are penciled with light brown.

The Black Breasted Red Game is a thoroughly good table fowl, the breast being full and meaty, the body plump and the flesh fine grained. It is a moderate layer of medium-sized eggs, rich in flavor. Having been too closely bred, for ornamental purposes, their constitutions are weakened and the chicks need extra care while young.

Brown Red Games.

In color of the head the Brown Red Game differs from the Black Breasted Red Game. The face is a dark purple; beak, black or dark brown; comb, wattles and earlobes, dark purple or black. The head of the cock is orange. The cock has a lemon colored hackle, with a black stripe down the center of each feather. The broad back is lemon, with a lemon-colored saddle, striped the same as hackle; the breast is black, laced with lemon; shoulders, black, except the shoulder coverts, between the wing and the back, which are lemon; the wing-bow is lemon, and the coverts are rich glossy black. The tail is, like that of the first mentioned bird, a rich, lustrous black; the shanks and feet are dark yellow, nearly black.

Duckwing Games. The Golden and Silver Duckwings are interesting types of the Game class. The two are similar in markings, the only difference in color being that one is golden or straw-colored while the other is white. In both birds the beak is horn-color; the face, comb, wattles and earlobes are red; the breast, tail and thighs are black, and the feet and shanks are yellow. In color of head, hackle and wings they differ. The head of the Golden Duckwing cock is straw color, with hackle free from black stripes, the back is golden and the wing-bow is a rich golden tinge; the wing-coverts form a distinct black bar across the wing. The Silver Duckwing cock is white where the color in the Golden Duckwing is golden or straw.

Red Pile Games. The plumage of the head of a Red Pile Game cock varies in color from bright orange to chestnut; the hackle is of the same color; back, crimson; breast, white, narrowly laced with chestnut; body, white; wing-bow, crimson, making a crimson wing, transversed with a white bar; tail and tail-coverts white. The hen has a chestnut head, and white hackle, edged with yellow; the back is white; breast, salmon; white or chestnut-tinged wings and white tail. The shanks and feet of both male and female are willow or yellow.

The Red Piles are similar in markings to the Black Breasted Red, the white being substituted for the black. It is supposed that the Red Pile was produced by breeding Black Breasted Red and White Games together.

White and Black Games. These two varieties are, in all characteristics, like the others of their class, differing only in color. The White Game has a yellow beak, red comb, wattles and earlobes, and yellow shanks and feet. In plumage they are a pure, spotless white.

The Black Game has a deep red comb, wattles and earlobes, black beak, shanks and feet and black, lustrous plumage.

Birchen Games. In color these birds are silvery-white and black. The head, hackle, back and saddle of the cock are silvery white, with a narrow dark stripe in the center of the feathers of the hackle and saddle. The breast is black, each feather being laced with silvery-white; the wing-coverts are glossy black; the tail and thighs are black; the shanks and feet are dark-willow and black. The hen is black, except hackle, which is silvery-white, with dark stripe down the center of each feather. The comb, wattles and earlobes are dark-purple or black.

Indian Games. No single breed of fowls, perhaps, has had the unabated popularity of the Indian Game. This fowl has been the center of attraction for many years past, and among its admirers are the most prominent breeders.

It is a beautiful bird and its every movement bespeaks its high breeding, it having an upright and proud carriage.

The Indian Game has many fine qualities to commend it to the breeder. Perhaps the most important section of the bird is the breast, which is very wide, round and prominent. The best comparison that can be made would be with a large, fat duck. The meat is very solid, yet sweet and juicy, and of the finest quality. It is the breast that gives the fowl its great weight, and it is the width and fullness of the breast

that causes the bird to carry its wings so far out and up, and its fullness all along the keel bone causes the bird to stand with legs well apart. The breast should never be straight or curved in, but always oval and full in contour. In plumage, the male should be green-black, never penciled. In the center along the breast-bone, the feathers should part, and thus allow the skin to show just at or above the upper point of the keel bone. This should appear in both male and female, and seems to be a feature of the breed, as it always shows from the time the chicks shed the down. The thighs should be well rounded and taper nicely toward the joint and should be very thick and meaty adjoining the body. Shanks should be very stout, well scaled and deep orange in color. Back toe should be almost flat on the ground. The tail should be very close and hard and the sickles rather short; tail should never appear bushy or fluffy, and should be carried out and down, and should be lustrous greenish-black in color. The cock should have a chestnut wing, bay and metallic black wing-bar; wings should be tightly folded, and ends of the secondaries rounding off quite abruptly and resting close against the tail, or, better still, just above it. The neck-hackle is composed of short, hard feathers, green-black with delicate crimson-brown shafts. The neck-hackle should never appear as a shawl, the throat should be dotted with very small feathers, and never bare. The eye should be yellow in old birds, approaching grey; beak, yellow, or striped with light horn color. The plumage of the female is the most difficult to obtain, and should be a beautiful combination of green-black and nut-brown throughout, green predominating. Each feather should be nut-brown and double penciled, with rich lustrous green-black over the body, and the penciling should be very distinct and look as though embossed.

Mr. O. K. Sharp, of Lockport, N. Y., who has successfully imported and bred them for years, speaks of them as follows:

"No breed can claim more intricate and delicate markings, and the birds' ability to breed comparatively true makes them all the more desirable. The true fancier will find in them the acme of his ambition, for judicious matings will surely bring grand results. Now that I have given a partial description of the main points which the true Indian Games must possess, I will briefly touch upon their qualities from a commercial standpoint.

"Without doubt they are the quickest growing chicks from the shell up to sixteen weeks of any living breed. Growing a very short feather, the nourishment required by other breeds to grow a long and entirely superfluous feather, in them is utilized in growing meat, and makes them the best broiler chicks yet discovered. Cockerels will easily weigh two pounds at seven to seven and a half weeks of age, and at eleven weeks will go three to four pounds each. As chicks they are very plump and solid, and command the highest market price as broilers. Their growth is very rapid up to about twenty weeks, when a good specimen should weigh, for cockerel, six and a half to seven pounds. A fowl that can make such rapid growth and take on flesh so readily must furnish meat of delicious flavor; it cannot well be otherwise. As a meat bird they surely excel all other varieties.

"We find them better layers than we anticipated, and we confidently believe them to be fully the equal of the Plymouth Rock in this respect. A number of America's most prominent artists and judges already admit

them to be the strongest rival the Plymouth Rock has ever had, and they certainly present points of superiority over the Rock in many respects. No other variety can be offered to so many classes of people interested in poultry as the Indian Games, and draw from each one a kind word for that particular quality toward which his fancy turns."

While not yet recognized in the Standard, the poultryman has a most valuable bird in the White Indian Game. This beautiful bird possesses all the qualities of its relative. They have the same courageous appearance of the Game, and have the true exhibition station and short, hard plumage of the Cornish Indian Game. Being of one color—a pure, spotless white—they are easier to breed than the Cornish. They make fine table fowls and are fairly good layers. The eggs hatch well and the chicks are plump and robust.

Black Breasted Red Malays.

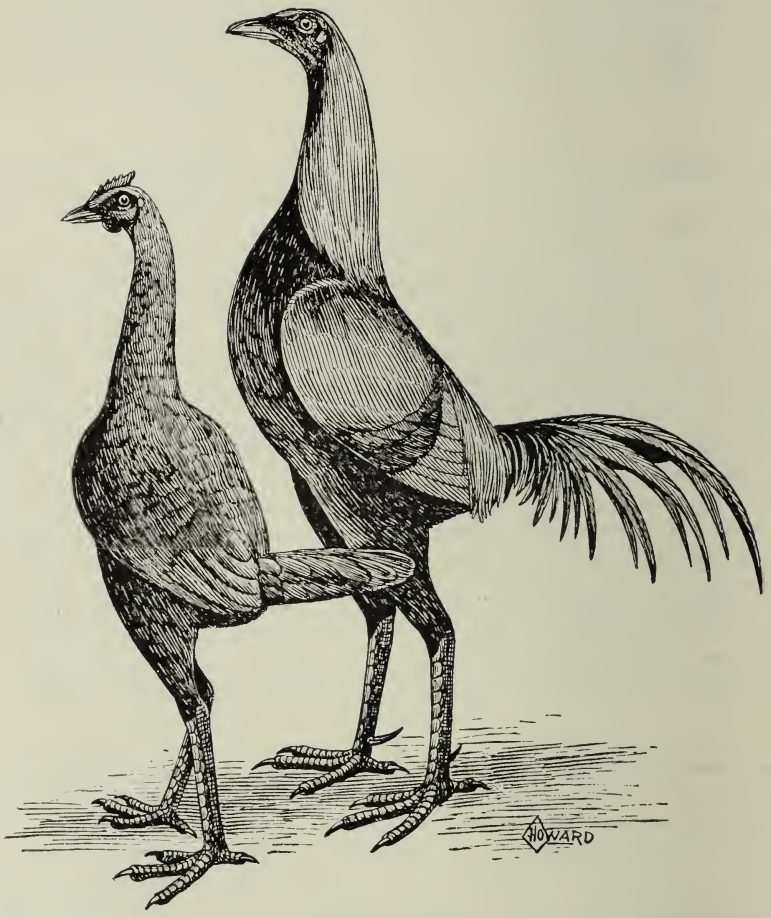
This upright and powerful looking bird has never been popular in this country. They are in the Game class, and are bred for exhibition only, not possessing qualities for practical purposes.

They are of medium size and in carriage they are particularly upright, the back being almost always at an angle of forty-five degrees. They are bulky at the shoulders and the wings stand out from their bodies. Their close plumage is red or maroon and black. The body narrows from the broad shoulders towards the tail, which droops down almost in a straight line with the back. The thighs are long and powerful, the longer the better. The head is carried high, and the neck is long and scanty of hackle. A striking feature of the Malay is the head ; it is long and snaky, with heavy and projecting brows over the eyes, which give the bird a hard, fierce and cruel expression. The wattles and ear-lobes are slight in development ; the skin of the throat and the upper part of the throat is a bright red, and the scantiness of the plumage causes this redness to show distinctly and is a characteristic of the breed. The shanks and toes are bright yellow. The disposition of the Malay is reputed to be very savage, and in battle they literally tear their opponents to pieces. They are very large and hardy ; for these reasons they have been used for crossing with other breeds to infuse vigor and size, when a breed is degenerating. The Malays are supposed to be one of the parent stock of the Black Javas.

Game Bantams.

It is unnecessary to go further into details of the shape and color of the Game Bantams, other than is given for the various Games, from which the Bantams have descended and derive their names.

The color of plumage, markings and shape must correspond with that of the Game, which bears its name, the diminutive size being the only distinguishing feature between the two. The cocks should average about 22 ounces in weight, and the hens 20 ounces. The Malay Bantams average two ounces heavier.



PAIR BLACK BREASTED RED GAMES.

Bantam Class--Other than Games.

Sebright, Rose Combed, Booted White, Cochin, Japanese, Polish.

Sebright Bantams. Among ornamental poultry, the Bantams are the most beautiful. Their tiny forms and their pert actions attract many admirers. As pets they are a decided success, affording pleasure that is *original* with them alone. In the Bantams we see the image in full of their parent; the exact reproduction in miniature of the shape and color.

Those who love fowls, and have limited space for keeping them, can keep Bantams very successfully and enjoy the pleasure of poultry raising on a small scale. It is not for pleasure alone that Bantams may be kept, for they have a practical value to their credit that will more than pay for the keeping. As layers they do well and lay a large egg for their size. When served on the table they afford a dish that is not far behind their larger parents. The larger Bantams do well for table purposes, and even the smaller ones may be used to advantage in this line. As sitters and mothers they are all that could be desired.

The Bantams have a history which is traceable to remote times, but the history of the "modern Bantam," if we are permitted to use that term, is within the present century. It was John Seabright who, in 1800, originated the varieties known as Golden and Silver Sebrights. These breeds were originated by crossing a common Bantam with a Polish fowl, and breeding the cross to a hen-feathered Bantam which Sir John accidentally found. After many years of careful breeding, beautiful birds have been produced which breed true to type, and this mark is still established to this date.

The plumage of the bird is rich golden-yellow in the Golden variety and silvery-white in the Silver variety; the feathers of each variety are distinctly laced with a narrow edging of black. The head is small and surmounted with a bright red rose-comb; the neck is well arched, and hen-feathered; the back is short and free from saddle-feathers; the breast is round and full, and the body is compact; the wings are large and carried low, so low, in fact, as to almost cover the hocks; the thighs must be short, and the shanks and toe slaty color. The cocks weigh from 24 to 26 ounces, and the hens about 20 ounces.

Rose Combed Bantams. There are two varieties of Rose Combed Bantams—the Black and the White Hamburgs in miniature. The cocks should have a small, round head; a short and slightly curved beak; large, prominent bright eyes; rose comb, square in front, fitting firmly on the head, evenly corrugated on the upper surface and ending in a spike with a slight upward curve; flat, closely fitting earlobes; broad, thin, smooth and well-rounded wattles; neck, small at the head, increasing in size as it approaches the shoulders, nicely arched and carried well back so as to bring the head towards the tail; abundant hackle of good length, sweeping over the shoulders; a very short back, broad at the shoulders and tapering towards the tail; long and plentiful saddle feathers; full,

round breast, carried forward in a prominent manner ; plump, compact and symmetrical body ; large wings, the points carried low and the secondaries slightly expanded ; full, expanded tail, furnished with long, curving sickles and coverts, and carried rather high ; short, well-rounded thighs, and short, clean, tapering shanks, not coarse in bone.

The hens should have small, neatly rounded head ; full, bright eyes ; rose comb, smaller and neater, but of the same character as that of the cock ; flat, smooth earlobes ; small wattles ; short, tapering neck, carried well back ; short back ; full, prominent breast ; compact, snugly made body ; ample wings, drooping, but not so much as in the cock ; full, expanded, rather upright tail ; short, round thighs ; and short, tapering, neat shanks.

The Black Rose Combed Bantam has black, lustrous plumage, and the White has plumage of pure, spotless white ; the Black has black or dark horn-colored beak ; the White, a yellow beak ; the Black has pure white earlobes, and the White, red ones ; the Black has dark leaden-blue shanks, and the White, yellow ones.

Booted White Bantams.

These Bantams are different from the others in having, as their name implies, heavily feathered or booted shanks. They have a small head and medium sized single comb ; the hackles are long and partly cover the shoulders ; the wings are large and droop slightly ; the tail is upright, with long sickles, and abundant coverts ; the thighs are medium in length and covered with long, stiff feathers or vulture hocks which nearly reach the ground ; the toes and shanks are yellow. The plumage is pure white. These Bantams are pets that can be kept in any garden, as their long vulture hocks prevent them from scratching and tearing the ground as other fowls do.

Cochin Bantams.

There are four varieties of Cochin Bantams—Buff, Partridge, White and Black. In color and shape they are the same as their larger parents. In weight they are the largest of the Bantam class. The cock weighs about 28 ounces and the hen 24 ounces.

Japanese Bantams.

The Black Tailed Japanese Bantams are quite favorites in this country. Their striking beauty and peculiar shaped tails make them favorites that place them in the front ranks of the Bantam class. They are white, except the tail and wings. The tail is black, and the sickles are black, edged with white. The wings are large and long, the points drooping ; the color of the primaries and secondaries is dark slate, edged with white ; when the wing is folded it apparently is white. The tail is expanded and carried in an upright position, almost touching the back of the head ; the sickles are long and curved gracefully. Their shanks are free from feathers and bright golden in color.

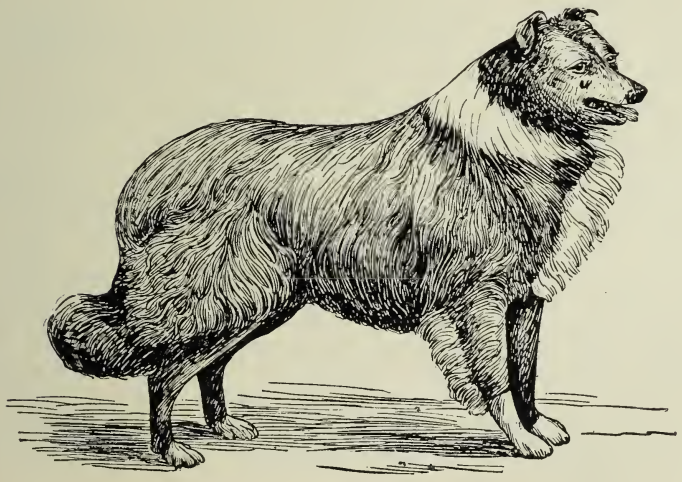
The White and Black Japanese Bantams are the same in size and shape as the Black Tailed variety. The beak, shanks and toes of the White are bright yellow, while those of the Black may be yellow, or yellow shaded with black ; the color of the white variety is pure white, and the Black has a lustrous black plumage.

Polish Bantams.

This beautiful little bird is of American origin, and originated about the year 1872 by an accidental cross of a White Polish cock and a common hen. The Poultry World gives the history of them as follows :

"They originated in the yards of a gentleman by the name of Isaac Murdock, whose postoffice address was Agawam, Mass., but who lived some three miles from that place. Mr. Murdock bred the Bantams resulting from this cross for four or five seasons before his death. After his death, a blacksmith of Springfield, Mass., George Newton by name, purchased the entire stock of Bantams, and offered some for sale through the columns of the poultry periodicals. At that time the chicks had small crests and the plumage was often disfigured by foul feathers. Mr. F. B. Zimmer, of Glens Falls, New York, was one of the first to purchase birds of Mr. Newton after he offered them for sale, and was the first to publicly exhibit them, showing a pair in the year 1881.

"Under the very careful breeding given them by Mr. Zimmer, the color has been established so that foul feathers no longer appear, and the crests have been nearly doubled in size. They were admitted to the Standard in 1879 or 1880 through the influence of a warm personal friend of Mr. Murdock, it is said, but careful inquiry has failed to elicit that friend's name. Since their admission to the Standard they have been disseminated throughout the country, and good birds may be had in a number of places. They are, however, as yet comparatively rare, and good specimens find a ready sale at remunerative prices."



MISCELLANEOUS CLASS.

RUSSIANS, SUMATRA, SILKY, SULTAN, FRIZZLES, RUMPLESS, YOKOHAMA, NAKED NECK.

Russians. The history of the Russian fowl in this country is very limited. From the best information obtainable, it appears that their earliest introduction into this country as a pure breed was at New Orleans about 50 years ago. It is probable that some of this breed was mixed with the ordinary poultry of England two hundred years ago and brought to this country by the colonists, for traces of them are found in the common fowls to this day all over the United States. The breed has little, if any, favor in this country, and as a result are run down and scattered promiscuously in a bad state. In size they are medium, the cocks weighing eight and one-half pounds, and the hens six and one-half pounds.

The cock has a well formed head, rather large in size; stout, well-curved, black or horn-colored beak; rose comb, without spike; full, heavy beard, which curves around to the back of the eyes; medium-sized earlobes; long, pendulous wattles; well-arched neck; broad back, tapering to the tail; full, round breast; broad compact body; wings of medium size; strong thighs; legs of medium length and dark-lead color; the bottom of the foot is yellow; the tail is erect and free from long sickle feathers.

The hen is bearded like the cock; has a similar but smaller comb; back of less width; full breast; tail of medium size and carried moderately erect; the legs are of the same hue as the cock's.

These fowls are called by Dickson, the "Russian or Siberian fowls," and in speaking of them he says:

"This breed seems to differ chiefly from others in having considerable tufts of brown or dark loose feathers springing from each jaw, and others longer or fuller from the lower mandible, like a Jew's beard. In the hen there is an upright tuft, spreading from the back of the head, of the same silky texture. Independently of these, the cock has the usual comb and wattles, and the hen a small comb likewise. This sort is said to have come from Moscow, and varies in color, one variety being white, with the ends of the feathers glossy blue or black, giving it a spotted appearance, and the legs being covered with fibrous or downy feathers. Another variety has the plumage of the Game fowl, a fine, tawny orange, spotted with black. This sort is said to be much esteemed in Scotland for prolific laying, but it does not appear to be known in England."

The Black Sumatra Game. For a truly beautiful bird, none is, perhaps, so little known as the Black Sumatra Game. We recognize in this bird many fine points that are worthy the consideration of the fancier and at the same time can be utilized with good results to the breeder. Considerable comment against the Sumatra has been made on account of its long, flowing tail, and lack of pit qualities. In this we must differ as regards

the gameness of the bird, for we have many times witnessed the defense of their mates and the protection of their young. Their attitude on such occasions is quick and determined in every action. They may be slow in opening a conflict, but when oppression leads them, no bird can show a greater amount of staying qualities than the Sumatra. This is only mentioned in behalf of their game qualities, and not with a desire to urge them as a breed for fighting purposes, but, to the contrary, we would breed them as an ornamental fowl.

When unmolested by other fowls, they can be bred as true pets, or as much so as any other domestic fowl. Their disposition is gentle, and no trouble is experienced in removing eggs from the nest or when catching the young in the yard. They are attentive to their young, ever watchful of danger, and their slow, stately tread bespeaks their aristocracy. Their plumage is very rich, being lustrous black throughout, which reflects radiantly a dark greenish cast in the light.

The tail is long and drooping, with an abundance of sickle feathers and coverts, which are long and flowing. This is the triumph which severs all connection with the Pit Game, and places them foremost as an ornamental breed.

Silky Fowls.

The Silky fowls are attractive and strange looking birds. Their soft and silky webless plumage distinctly separates them from the other varieties of poultry and affords a different and novel feature for the fancier. Silkies are not extensively bred in this country, but in England they are very popular and at the shows form a large part of the exhibitions. Their feathers, when in prime condition, are exceedingly loose and fluffy, standing out from the body in all directions, giving the fowl the appearance of a large bird, which their weight does not justify.

In weight the cocks average from two and one-half to four pounds each, while the hens average from two to two and a half pounds each.

The birds are of rather square, compact Cochin-build; crested, the cock's crest running back horizontally, while the hen's is globular; five toed; feather-legged; rose comb, nearly round, having a lumpy appearance with few, if any corrugations on top, and in color a dark purple; earlobes, blue or purple, tinged with white; skin, violet, approaching black; the covering of the bones being of the same color; shanks, dark blue or black; plumage, white, and downy in appearance.

The Silky fowl lays a small egg of pale buff color. They lay from ten to twenty-five before wanting to sit. They make excellent mothers and are very valuable to hatch and rear Bantams or Pheasants. Their downy feathers make a warm cover for the tender little ones of the more delicate varieties.

Sultans.

These fowls were first imported into England from Turkey in 1854, and did not reach America for some years after. They might be classed with the Polish with propriety, considering the characteristics which they possess.

A compact crest surmounts their head, while their throats are muffled by a full beard. Two small spikes constitute the comb. The neck and saddle hackle is long and flowing, being developed to a large size. The legs are heavily feathered and booted and hocks vultured. They possess a fifth toe. The tail is full and erect; in the cock it is well sickled. In general form they are square and full. They combine with

their beauty a brisk and happy temperament. While their beauty is their chief recommendation, they still lay claim to modest usefulness—but only as layers, being too small for table fowls. They thrive well on a limited range or in confinement, while, owing to their docility, they may become a rival to the Bantams as pets.

Frizzled Fowls. For general grotesqueness, the Frizzled fowls are, perhaps, the most noted of any. Their name, very appropriately applied from the peculiar manner in which the feathers curve backwards and upwards at the ends, gives a clue to their characteristics. As these birds vary in color, there is no rule for judging their plumage, except that it should curve upwards at the ends, as if in rebellion against the laws of nature. This curving is most conspicuous in the hackle and saddle feathers. Any color is admissible, but the birds should match in the show pen. The combs may be either double or single. The Frizzled fowls are reported to be hardy and very early and good layers.

Rumpless Fowls. This variety of fowls has been known for several hundred years. It is sometimes called the "tailless fowl," or "fowl without a tail or rump." In speaking of these fowls, Mr. Wright says :

"Rumpless fowls are not only destitute of tail feathers, but it is found by plucking them that the caudal projection from which the tail grows is utterly wanting; while on still further investigation by dissection, it is discovered that even the spine itself is deficient in the final vertebræ. These peculiarities have become so strongly fixed by long descent, that a Rumpless fowl crossed with any other fowl almost always produces a vast majority of Rumpless chickens. Hence, given a pure bred Rumpless fowl, it is easy to establish a rumpless breed of any character which may be desired; and by this means the Rumpless Polish, Rumpless Bantams, etc., have been produced. These crossbred birds, however, are far less certain to reproduce their kind."

Yokohama Fowls. The principal peculiarity of this breed consists of its immense length of tail and hackle feathers. These are often exhibited as the Yokohamas; others, said to be superior in these points, are called the Phoenix fowls. This bird is often seen in Japanese pictures—a long-tailed bird, hovering down from heaven and bearing a little god. The Fung, or Phoenix, is one of the myths of the Japanese religion, and it is thought that the Yokohama fowls were like those found in the paintings; hence the name of Phoenix is applied to the breed.

The numerous drawings and photographs fail to show any real distinction between greater or less development of the peculiar plumage. The tails of these specimens average about a yard in length, and the general appearance is not only of the Game fowls, but all the colors were Game colors—Whites, Piles, Duckwings and later a few Black Reds. The Countess Ulm-Urbach holds that the Yokohama and the Phoenix are different breeds of fowls.

Mr. Gerald Waller, of England, who made a very extended trip through Japan, says there are no such fowls as the Phoenix or Yokohama, but that there is a "Shinewaratoa" fowl, which is extremely rare, and answers the description given the Phoenix. The Phoenix and Yoko-

nama are names given the fowls by those who imported them. His description of the fowls is as follows: "One of, if not, the most striking objects in the natural museum department of the splendid new museum at Tokio is the large glass case, some eight feet high, containing, placed on a perch, one turned either way, two badly preserved specimens of these long-tailed fowls, the tail feathers of both of which descend from above the perch to the floor of the case, and these wind backward and forward a number of times in such a manner as to render it quite impossible to gain anything like an accurate measurement of their length, but which is, I have been informed, over 17 feet. I tried to obtain permission from the authorities at Tokio to be allowed to photograph these two specimens, but failed. There is also a picture which has, I believe, no connection whatever with the stuffed specimens except as giving Japanese characters and a general description of this breed, and of one bird owned by Mr. Shimansuchi Toralici, the Shizoku, of Kochiken, from which the name is taken, with tail feathers 13 feet six inches long. I have been told that the tail feathers of the male birds of the Shinewaratao breed will grow 23 feet long, and I have no reason to disbelieve this statement. If a bird can grow a tail, the sickle feathers of which are 13 feet six inches long, I do not see why it should not grow one 23 feet long."

Tails of more than four or five feet have been bred from imported stock on the Continent and in England. It is believed that none of the specimens having the longest tail have ever been imported. Mr. Waller states that the cocks, such as the stuffed specimens described, cannot be bought at any price. The way in which the Japanese fanciers keep the birds having tails of immoderate length goes, on the other hand, to sustain the theory that the imported birds might grow full length tails except for the injury to the feathers from dragging on the ground. The Japanese keep these birds in high, narrow cages, sitting upon perches covered with straw rope. Food and water are placed at each end of this perch, and three times a day the birds are taken down and given a little exercise in a clean place.

The White Phoenix, or Yokohama, is mentioned by an Englishman who traveled in Japan in 1881. This bird has a long tail, but not so voluminous as the specimens brought to Hamburg. A tail feather, broken a little at the thick end was found to measure 28½ inches.

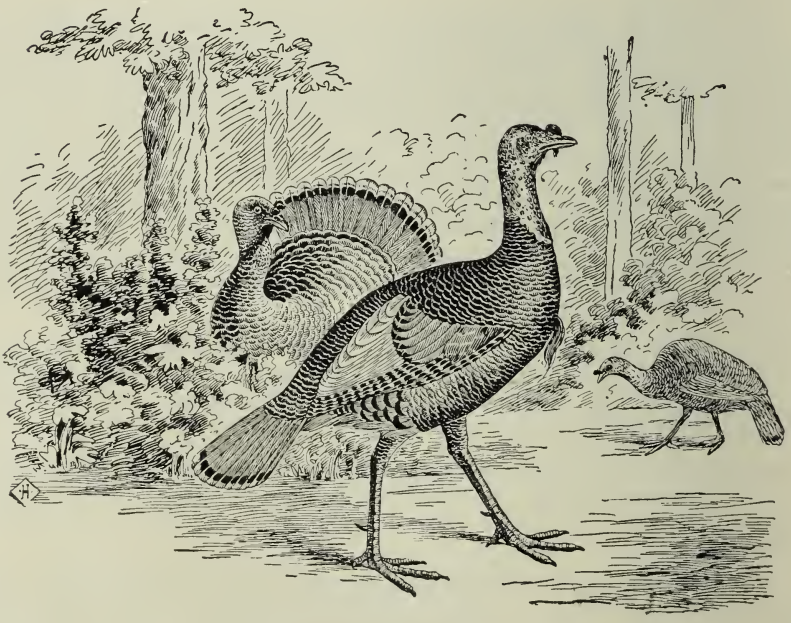
There is a vast difference of opinion in the matter of the comb, but the majority are strongly in favor of the single comb. Not having a standard of any kind, there are all styles and varieties of combs and feathers.

It is asserted by Mr. Waller that the male birds moulted their tails but once in three years. This is hardly credible—to breed any birds that will moult less than once a year—but if such is the case there would be no reason why the birds should not produce feathers of a wonderful length.

This breed is undoubtedly a wonderful variety to the fancy, but our knowledge of it is not sufficient to pass any further opinion on it. The breeders in this country are practically in ignorance of their habits at the present time, but it would be a grand sight to see a pen of these birds in all their wonderful plumage and peculiarities.

Naked Necks. The Naked Neck fowls have no attraction for the fancier, save the oddity of their bare or naked necks. They were at first supposed to have originated in Austria, where tradition points to their origin as coming from a severe scald on the neck, which caused the loss of feathers, and this mark has been transmitted to their progeny.

In size and color they vary, as no fixed rules are used in their breeding. When exhibiting, the birds which resemble each other should be chosen, and should be as near alike in plumage as possible. These birds are not favorites in this country, nor do they possess any qualities for the practical breeder. The bareness of their necks causes aversion to them.



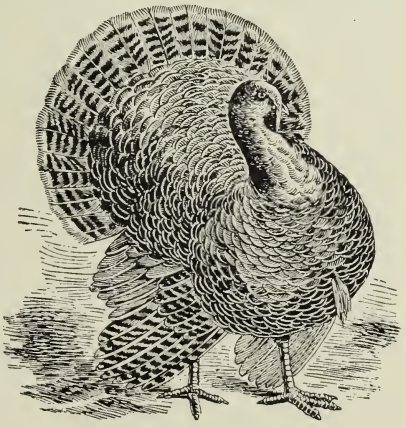
WILD TURKEYS.

TURKEYS

The NAME turkey as applied to our favorite fowl, is explainable only upon the theory of its Asiatic origin. By the French the fowl is called *dindon* or *dinde*, a contraction of *oiseau a'Inde* (bird of India.) The Greeks and Romans had what they called *meleagrides* or *Gallinoe Africaneo*, which were supposed to be the original race of turkeys, but they were in reality Guinea fowls. The first writer who mentions the American turkey is believed to be Oviedo, in 1525, who describes them under the name of peacocks, commenting upon the vast number found in the wild state in this country at that early day and their excellence as an article of food. He found them raised by Europeans in New Spain, whence they were introduced into New Castile and the West Indies. Their history and discovery, like the history of most breeds of domestic fowls, are involved in obscurity, but it is certain that their origin is American.

Its popular and scientific names are both unwarranted, and arose from a misapprehension of what the bird really was, some supposing it to be allied to the Guinea fowl, and others to the peacock.

The turkey is the most valuable domestic fowl and the successful raising of them is very profitable to the breeder. Aside from being the largest of all poultry, its flesh is of the finest and more esteemed than any other. In proper locations it gathers more than half of its living from the woods. By raising an early brood a great saving is made, as the young will catch the first crop of grasshoppers, and in this way prove of double value.

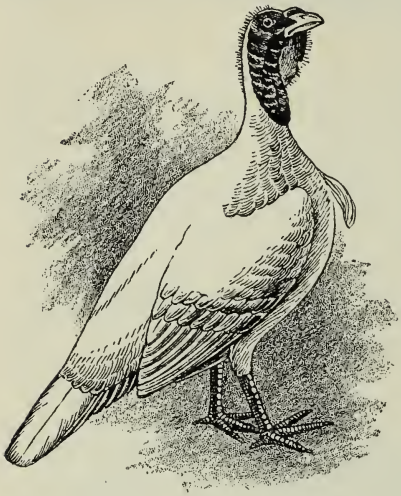


BRONZE TURKEY.

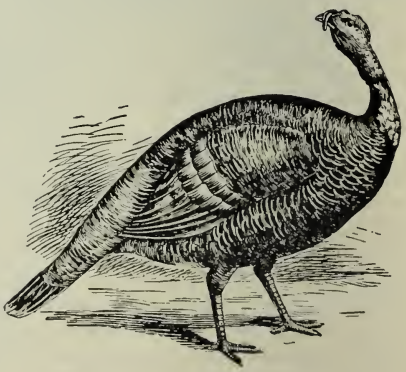
To successfully raise turkeys you must have vigorous birds. This is more essential with the turkey than with any other fowl, as they are very susceptible to surroundings and influences, and inbreeding is strenously to be avoided. Bad food and neglect will dwarf their growth and weaken their constitutions, giving bad results and poor return to the breeder. To maintain size is one of the most important as well as profitable points in raising turkeys. In selecting the breeding stock care must be taken in the size of the male. He should

weigh from 30 to 35 pounds and be in perfect condition. It is not so important to have such large females. If the hens are in good condition they should weigh from 15 to 20 pounds. A good idea for farmers of one neighborhood is to club together and purchase a fine gobler for breeding, and select the best hens. With care and attention there would soon be a marked improvement in their hardiness and size.

It is best to breed from birds two or three years old as they produce stronger and larger stock at this age. The time for setting the first eggs is in March or April, but the character of the season will influence this. The turkey's nest should be on the bare ground, free from danger of flooding during rain, and located in some quiet place. While setting, special care should be taken that the hens are off their nests at regular periods. As turkeys are patient setters, two broods can be hatched by one hen. A good plan is to set all hens at once, and give the broods of several to one hen. This allows the others to return to laying. Turkey eggs hatch in 28 days. When hatched the mother should be confined in a roomy coop, with a slatted front, open to the south, on a clean grass run. For the first 24 hours no food is needed, as the yolk of the egg from which the poult was hatched serves as nourishment for that period. Be sure that the hen and her brood are free from vermin. Lice are as destructive to turkeys as to chickens. Always dust with insect powder before taking from the nest, and if you find lice on the heads of the poults, rub a few drops of sweet oil on their heads, or a mixture of two or three drops of carbolic acid in a teaspoonful of oil. For the first four or five days the food should be light. Hard boiled eggs mixed with bread crumbs make a splendid food, and should be fed four or five times a day. Curd made from sour milk, with young onion tops cut very fine and mixed with it, is excellent. When the young are a week old they may be given some cracked corn or oats, or wheat grits. Boiled Indian meal can be used as a variety in feeding. Always give fresh, cold water two or three times a day, and if possible, give milk as an occasional drink.



WHITE HOLLAND TURKEY.

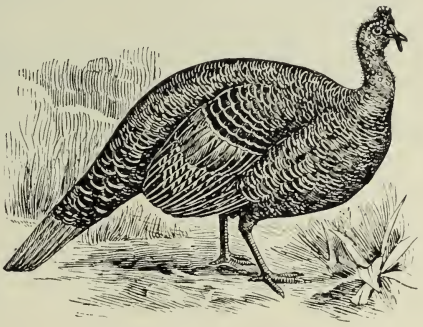


NARRAGANSETT TURKEY.

When the young are about three weeks old, the old bird may be let out with them every morning after the dew is off the grass, but they should be shut up again every evening. The great secret of turkey raising is keeping the poults from being chilled. If they can be kept dry until

they have thrown out the red on their heads, the chances for success are very bright, as they have then become quite hardy and may be allowed to roam at will.

When they get so that they can fly up to their roost they should be placed in the turkey house. This house can be built in a variety of forms to suit the builder. It should be large and roomy, with broad perches of easy access from the ground. They should be locked up every night and made secure against dogs, foxes, etc. Feed every morning and night with a variety of food, and they will gather from the fields and woods sufficient numbers of grasshoppers and other insects to supply their noonday meal.



OSCELLATED TURKEY.

A turkey does not attain its full weight until the third year. Gobblers that are eight months sometimes weigh from 23 to 29 pounds, and hens from 13 to 15. A great mistake is made by many when they sell their largest birds and save the smallest and last hatch for breeding purposes. This should never be done if you wish to produce a large and healthy stock. A ten months cock weighing 30 pounds is cheaper at $50 than a 20 pound bird at $5 ; young hens weighing 16 to 18 pounds are cheaper at $20 than 12 pound ones at $5. The large well formed birds will leave their mark upon their progeny.

Crested turkeys have been considered by some naturalists to be a distinct species ; but all attempts to breed them true to this point, have failed, and they must be considered as merely accidental, though showing a strong relationship or affinity between the turkey and the peacock. The birds that have hitherto been bred from have failed to produce crested progeny. Experiments have been made by the most skillful breeders in both England and America without any degree of success ; the crest is therefore only an accidental "sport," and the bird is not a distinct specie.

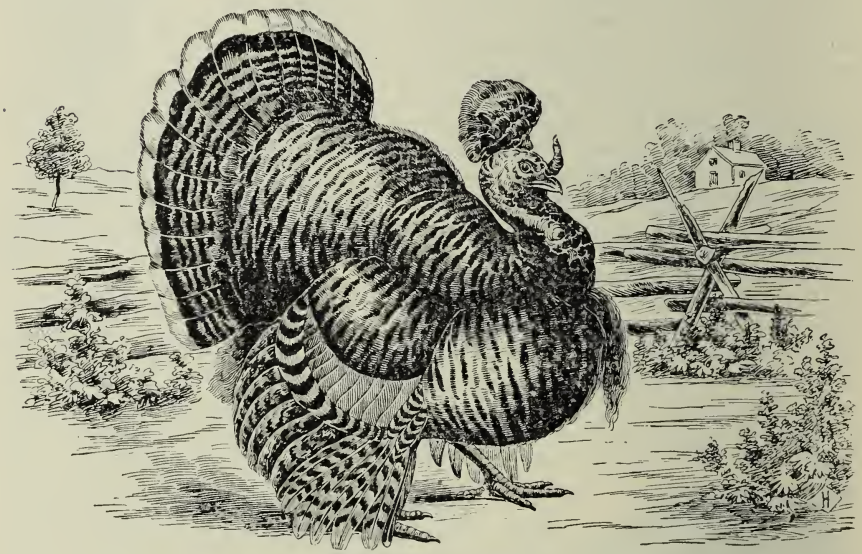
The American bronze turkey stands at the head of the poultry race, and is appropriately denominated "the king of domestic fowls." The grand proportions and enormous weight which these birds reach in late years seems almost fabulous. At two years old many specimens have weighed between 35 and 40 pounds, and yearling gobblers are not uncommon that weigh from 25 to 30 pounds. Hen turkeys at these ages will when in full breeding condition, weigh 18 to 20 pounds. This has been effected through judicious and wise selections.



BLACK TURKEY.

The native wild turkey is still common in various parts of North America, and fine specimens are met with in the West and in Canada, while they are still found in small numbers in the Middle and Eastern States. The average size of the wild turkey is less than that of the domestic bird. "The grand size and beauty of this fowl," said Audubon, "and its value as a delicate and justly prized article of food, renders this

the most interesting of the birds of the United States. The flesh is more delicate than that of the domestic turkey, and the Western Indians so value it that it is called "the white man's dish." The plumage of the North American turkey is very brilliant, being of a metallic bronze blue, which is made up of black, green, bay and brown feathers. The cock is much the more showily plumed; the female being much duller in feather color. The Oscellated or South American wild turkey, is a different specie, and more brilliant in plumage. This bird is not so well adapted to our climate as its North American congener, and is almost unknown in the United States and Europe, though it was probably raised in Mexico for centuries before the conquest of that country by the Spaniards, since when they invaded the land they found it in a domestic state.



CRESTED TURKEY.



DUCKS.

The duck has always been an adjunct to poultry on the farm, but until recent years duck raising has never been considered a profitable enterprise alone. Notwithstanding the increased production of ducks, the supply of this class of poultry is insufficient for the demand. Duck culture is a comparatively new field for the poultryman; it is one in which greater profit may be realized, for the capital and labor required, than any other branch of the poultry business.

The most profitable method is to combine duck and chicken raising. When conducted on a large scale by artificial incubation, the two branches do not conflict with each other, but assist in maintaining a steady income to the breeder. By adopting artificial incubation, the brooding-house can be utilized for chicks in November and December, and in February, when the chicks are removed from the brooders, the buildings can then be used for ducklings. If the chicks be kept for roasters, the ducklings, though six to eight weeks younger, will be ready to market about the same time as the chicks. Early spring is the best time to market ducklings, as this is the season when they command the highest price.

In hatching ducks, the same principles of incubation apply as for chicks. The chapter on incubation fully describes the details for hatching chicks, and is also applicable for hatching ducks. When natural incubation is used, dependence is placed in the hen, and you will have to await her inclination to set.

Ducks are hardier and not subject to as many ailments as chicks, hence are easier cared for and comparatively free from disease, which often causes sad havoc in broods of chicks. The duck, when confined in runs, is constantly on the move, keeping up an incessant exercise from morning till night. This activity is advantageous to the health of the fowl, and especially adapts it to confinement. Rains, snows and cold weather are detrimental to the chick, extra care being necessary to keep it warm and dry.

It is quite different with the duck during wet weather. The heavy feathering protects it from the cold, and enables it to thrive at the season of the year when profits are most remunerative, and snow and rain are its delight. Ducks must be provided dry quarters at night by placing straw

or dry earth on the floor of the duck house, which should be removed when it becomes damp from the droppings and replaced with dry bedding. Although ducks are very hardy, there is nothing which will introduce disease quicker than damp bedding. It is imperative that ducks have dry bedding, if the greatest success is to be attained. Cold feet with the duck has the same effect as a frozen comb on the chick, it hinders and often entirely stops egg production.

The supposition that ducks could only be successfully bred where water was supplied for bathing purposes is a mistaken idea, for good results have been obtained where ducks have been kept in confinement, with only sufficient water for drinking purposes. When confined the duck must be supplied with an abundance of green and soft foods.

A duck house should be built on a location having good drainage; it should be constructed plain, warm and convenient, and made proof against rats, weasels, minks and other destructive vermin.

The plan shown in Fig. 1 (page 124), is 20x25 feet, and will nicely accommodate a flock of fifty ducks. It is four feet high in front and seven feet high in rear, with two windows in front facing south. The door may be placed in either end of the house. The only interior arrangement of a duck house is the nests, which should be placed on the floor. The nests should be large and roomy, about 16 inches wide, 18 inches long and 12 inches high, with a strip four inches wide nailed on front to hold the nesting material in place.

The house as described above can be built in rows, if it be desired to keep more than one flock. The runs should be 80 to 100 feet long, separated by mesh-wire fencing. In building these houses a passage the entire length of the building should be made for feeding and watering purposes. This passage way is five feet wide, and separated from the houses by a mesh-wire partition. The feed troughs and water fountains are placed in the passage, as shown in ground plan, Fig. 2. A perspective drawing of houses without runs is shown in Fig. 3.

The food of ducks should consist mainly of meat, vegetables and grasses, with a small ration of grain during the middle of the day. The wild duck obtains its food from brooks, ponds and water fronts, and consists chiefly of grasses, roots, flags, small fish and various kinds of water insects. This class of food should be supplied the domesticated duck in confinement in preference to hard grain diet. The duck has no crop; the small duct or passage leads from its throat direct to its gizzard.

During cold weather they should be fed three times a day. The morning and evening meals should be a mash of wheat bran and corn meal, mixed with boiled turnips, potatoes or cabbage, and a small quantity of ground meat. At noon cracked corn, wheat and oats should be fed. Cabbage leaves and turnip tops thrown in the pens between meals will be relished by the ducks. Provide a small patch of green rye when convenient. Do not leave any food in the troughs to sour. Feed only as much as the birds will eat up clean.

An excellent food consists of a mash of cooked turnips or potatoes, with one-third corn meal or wheat screenings added, to be fed three times a day until the ducklings are three weeks old. Fresh fish, grass and herbage is an agreeable diet for ducklings. *Skimmed or sour milk may be mixed with the mash, but should never be given as drink.* Ducklings should be kept in warm, dry coops. The coops should be closed early at night and opened late in the morning. Until they are a month old, the ducklings should be allowed to remain only a short time at intervals

in the water, for too long bathing produces cramps when young. Cold dews and showers will stunt them at this age, and, like young turkeys, they seldom recover from the effects of the chill.

The Mallard Duck. The Mallard or Wild Duck is conceded by naturalists to be the parent of our farm breeds of ducks. The range of the Mallard is throughout the entire continent of Europe and North America; in summer its range is the extreme north and in winter to the torrid zone. The plumage of the Mallard drake is dense and elastic, and beautifully colored. The bill is greenish yellow, feet, reddish orange, and claws deep reddish brown; head and neck, deep green, changing to violet; on the middle of the neck is a ring of white; the lower neck and a small portion of the breast a deep chestnut, or purplish brown; the back is yellowish brown, tinged with gray; the hind part of back, brownish black; rump, deep green, as are the recurved feathers of the tail, the rest being brownish gray, broadly edged with white; the wing-coverts, the primary quills and coverts, brownish gray; the secondary coverts are white in the middle, with a terminal band of velvet black; about ten of the secondaries have the outer webs brilliant deep green, changing to purplish blue, with a black bar at the ends, succeeded with white; the outer edge of the inner secondaries are deep purplish brown, the rest gray; the breast, sides and abdomen are grayish white, minutely undulated with dark gray; the feathers under the tail are black, glossed with blue; lower wing coverts are white.

The female is smaller than the male, with a greenish gray bill, and dusky brown feathers, edged with pale reddish brown; a white throat, the lower part of which is yellowish gray, spotted with brown. The female renews its plumage every autumn, as does also the male. The latter undergoes another change in the summer, when he assumes a plumage like that of his mate, though of darker hue. By October he is clothed with a new coat of feathers and is through moulting for the second time.

The Aylesburg Duck. This duck receives its name from Aylesburg, a county town of Buckinghamshire, England. The plumage of the Aylesburg is pure white throughout. There is no difference in the plumage of the sexes, except the curled feathers in the tail of the drake, indicative of his descent from the Mallard. The head is long and neatly formed; eyes of a deep leaden blue color; bill of pale flesh color or pinkish hue; neck slender, long and gracefully curved, body, long and canoe shaped, with a round, full breast; shanks are brilliant light orange color; wings strong and nicely folded; back is long and broad.

The Aylesburg duck is very popular in America and occupies a prominent place among its class. Their weights are: drake, nine pounds; duck, eight pounds. Pairs have been exhibited that weighed eighteen pounds.

The Black East Indian Duck. This variety of duck has long been known under the various names of Black East Indian, Buenos Ayres, Black Labrador and the Black Brazilian. It is very handsome and is really the bantam of its class and is bred for small size and iridescent plumage.

The head is short; the bill is short and dark yellowish green in color; the neck is short and neatly curved; back, broad in length and medium in width; breast, round and plump; body, long and slender; wings,

small and nicely folded ; tail, short with two recurved feathers in drake ; thighs, short ; shanks are short and nearly black in color. The plumage throughout is black, with a rich green luster. In size the drake seldom exceeds two and one-half pounds, and the duck two pounds.

The Call Duck. There are two distinct varieties of the Call Duck—the gray and white. In size and shape they are almost identical, and are smaller than the common duck. As the name implies, this variety is noted for its loud and continuous quacking in a shrill note ; this characteristic renders it valuable to sportsmen as decoy. In color the white variety is spotless white throughout.

The Gray, both male and female, is similar to the Rouen in plumage. It is very sprightly and is becoming popular among duck fanciers. It is small in size and belongs to the bantam class.

The Black Cayuga Duck. This duck has been bred in this country so long that all trace of its origin is lost. Tradition says that it descended from a *sort* of wild duck that stopped in Cayuga and Seneca river on its flight north and south, in fall and spring, yet no specimens have been seen which closely resembles it in weight or color. It is sometimes called the Black River duck, Cayuga or Lake duck.

There existed in England, many years ago, a large black duck, which, it is said, was closely allied to the Cayuga, if not identical with it. It is probable that a black variety might have sprung from the Mallard, both in England and in this country. This would not, of course, detract at all from America's honor in originating the Cayuga. It is distinctly an American production, and combines, in a marked degree, many excellent qualities, with so very few faults, that it is worthy of the fostering care of American breeders. If proper care be taken in the selection of breeding stock, if size be increased and hardiness maintained, there is reason to believe that there will be a greater demand for this stock at home and abroad.

The Cayuga duck of to-day possesses a glossy, black head, dark hazel eyes, a dark or black bill ; a gracefully curving neck, clad in black feathers, with a greenish luster ; a long, broad back and a long finely shaped and plump body, both a glossy black hue ; long, well folded black wings, the primaries of the duck sometimes being a dark brown and the coverts of the drake very lustrous green black ; the tail feathers black, and black is also preferred for the shanks, though dark slate is permissible. In the sunlight the back and wings often throw purple reflections. The plumage throughout, when in the best condition, should be glossy black in parts, with green reflections.

The average weight of Cayuga ducks, per pair, is from 12 to 14 pounds, but as they fatten readily, they can be made to attain a weight of 17 to 18 pounds per pair. By avoiding too close breeding, and carefully selecting specimens for breeding, the Cayuga may be made to weigh as much as the Rouen or Aylesburg.

The Cayuga is extremely hardy, and ranks among the best layers, producing eighty or ninety eggs in the spring and sometimes laying in the autumn. The flesh of the Cayuga is considered by competent judges to be of the highest quality. Care in feeding must be taken, as it fattens easily and has a tendency to get down behind.

They are quiet and mild in disposition, rarely able to fly, a foot board being sufficient to restrain them.

The Crested White Duck. Among the interesting specimens of ducks, the Crested White holds a conspicuous position. It can be considered in the heavy class, the drake weighing seven and the duck six pounds. It has a medium sized head and rather slender, long neck; well rounded breast and medium broad back. The bill is yellow; shanks are short and light orange in color; toes are straight and same color as shanks. In plumage they are pure white throughout. The peculiarity of its name is from the large white crest on its head, which resembles that of the Polish fowl, which makes it very pretty.

The Pekin Duck. The Pekin is the favorite duck in this country. The first breed originally came from Pekin, China, the first importation being made in 1873. The weight of the drake is eight and the duck seven pounds. In plumage it is downy and the color a faint creamy white throughout. The head of both drake and duck is long; bill, deep yellow in color and medium in size; eyes, leaden blue in color; the neck of drake is thick and long; in the duck it is of medium length; back, broad; breast, full; the body is very long and deep; wings, short, which renders it easy for confinement; shanks are strong, and reddish orange in color.

The Pekin duck is a prolific layer, hardy, easy to breed and not over fond of water.

The Rouen Duck. This duck bears a close resemblance to the Wild or Mallard duck in its plumage, though domestication has lost the light and graceful shape of its ancestor, it being heavier in build and fattens with greater aptitude. It came originally from the city of Rouen, in Normandy, as its name indicates. It is very hardy, and fattens readily. The drake should have a clear yellow bill, with a slight greenish tint; a bright yellow is objectionable, and on the other hand a leaden color is a very bad defect. The bill should come straight down from the skull, like that of the woodcock, and be broad and long. The head is a rich green, glossed with purple, which extends down the neck, around which is a collar or ring of pure white, not quite meeting at the back. The breast is a rich, deep claret, extending well down below the water line, and then passes into the delicate French gray of the under parts, which extends to the tail. The back is a rich greenish black, the curls in the tail being a dark green. The wings are grayish brown, with a "ribbon mark" across them, which should be a very bright and distinct blue, edged with white. The flights are gray and brown, and the legs are a rich orange. The appearance of the drake should be commanding.

The bill of the duck is not quite so large as that of the drake, and is of an orange color, nearly black, two-thirds down from the head. The color changes during the laying season to a dirty brown, and sometimes it becomes nearly black all over. The head is brown, with two distinct lined shades running down one each side from the eye to the darker part of the neck. The breast is brown, penciled over with dark brown, almost black. The wing has a ribbon mark as in the drake, and the legs are like his, orange, but generally of a duller tinge. The Rouen is an excellent layer, and the most profitable breeder for the farmer.

The Wood Duck. This duck is sometimes called the Carolina duck. It is found in nearly every section of North America, being found in the southern portion in the winter and migrating to the north in summer. It is the most beautiful variety of

the web-footed family, if we except its cousin, the Mandarin duck. It is bred for its wonderful beauty. Its name is derived from its characteristic of building its nest in a hollow tree. Its eggs are small and smooth on surface, like polished ivory.

The drake is about twenty inches long, with a green head, glossed with purple and surmounted with a pendant crest or plume of green, bronze and velvet; the upper part of the throat is white; the breast chestnut; the sides yellowish, banded with black, the lower parts being nearly white; the wings and tails have black, white, purple and blue in bands, spots and shadings. The plumage is rather dull, not so showy as the duck and from June to September the drake is more plainly attired.

The Muscovy Duck. The White Muscovy duck has some peculiar characteristics, being long and large in common with its cousins, the colored Muscovies having longer wings and tails than any other breed of ducks. The color, as the name indicates, is pure white in all the plumage. The bill is short in proportion to the size of the body, and, being wide at the base, it appears stout; is of pink color; not the same as the legs, those being yellow. The bird appears long, owing partly to the length of tail, yet there is a breadth of breast and body which prevents an appearance of slimness; neither is the neck long in proportion to the body. The drake is considerably larger than the duck, so that the sex may be easily distinguished at a distance. The head of the drake is large and surmounted with a crest; this crest rises and falls when the bird is frightened or attacked. Another feature, which is quite ornamental when contrasted with the white plumage, is the red face and scarlet earbuncles at the base of the bill. These become enlarged with age. The comb and wattle are bright red, and full in time of health, while exhaustion from laying or any other cause makes them turn dark colored and shrunken. Muscovy ducks perch like pigeons, and can fly a considerable distance with ease, their long wings giving them this advantage over other species of domestic ducks. This variety is sometimes known as the "Musk duck," owing to the peculiar odor of the bird in the feather, which, however, is not traceable when it is dressed for the table.

The Mandarin Duck. The Mandarin duck is one of the most beautiful birds among water fowls. It is sometimes called the "Fan-winged" duck, from the peculiar shape of a portion of its wings, which rises over the back in the shape of a lady's fan. The head has a crest, falling gracefully back on the neck. The color of the body plumage is very fine and uniform in this curious variety—considered in China the prettiest of the duck class.

Mr. Haight, an observant traveler in China, says that "We in America call the ducks of China by names unlike those used by the Chinese. What we call the Pekin duck is called by the Chinese in the north the Mandarin duck, from the fact that they are kept in large numbers by the Mandarins at Peikn and throughout the northern provinces. What we call the Mandarin is a wild duck, large numbers of which are found in the north of China, and are called by the Chinese simply 'wild ducks.' They perch on trees, except during the moulting period, when they nest among the leaves on the ground. They are capable of being domesticated, and large numbers are sent to southern China for this purpose."

It is said that they dwell mostly in pairs, and are so greatly attached to their original companions that they do not usually mate a second time if either be killed. This statement is probably more romantic than truthful. In habits it is much like our American Wood (or Summer) duck—shy, timid and secretive. But it is handsome, and for a variety make a very beautiful and ornamental water fowl for pond or artificial lake. As regards size, it is about that of the American Teal.

GEESE.

The conditions for raising geese differ somewhat from those employed for other varieties of poultry. The hen and duck may be successfully raised in confinement, but the goose requires free range, water, and green pastures to thrive. Those having these facilities cannot fail to make goose raising profitable. The expense for food is small, when compared with the cost of fowls in confinement, while the profits add much to the breeder's income.

There are many places on a farm, worthless for cultivation, that could be utilized with splendid results for a goose pasture. In locating a place for geese, have it near water—an unused spring or branch will be a paradise for the birds.

Geese are long-lived birds. They retain their laying and hatching qualities through life, which makes them a bird of profit. They attain great age ; birds of forty are by no means rare, while those of twenty are often seen. The ganders, however, should not be kept beyond two or three years, as they become quarrelsome and unproductive after that age.

In mating there should be one gander for every three or four geese. Geese should be plucked about three times a year, and should yield an average of one pound of feathers for each bird. The feathers should be plucked when there is no blood in the ends of the quills, or when the feathers come off without hard pulling.

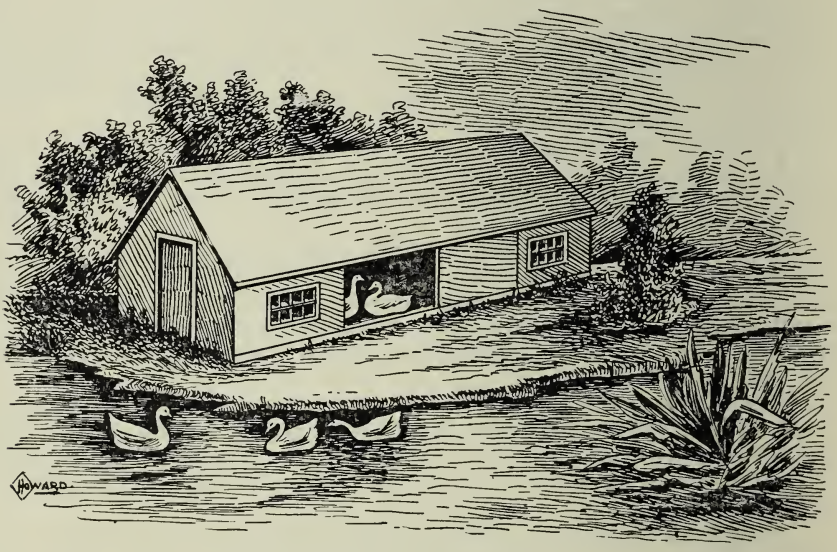
Almost all varieties of geese are good sitters, and need only ordinary precautions in setting them to insure favorable results. After laying a dozen eggs, they feather their nests in a manner almost identical with that employed by their wild congeners, and at once commence the duties of incubation. After a few days' trial the eggs may be given the sitter and little care is needed for the next month, during which she will sit quietly, provided she is not too much annoyed and interfered with.

At the end of a month the goslings will appear in good shape to begin life on their own account. For the first day or two they require only the same diet of boiled egg and bread crumbs as chicks of any domestic fowl receive, with, perhaps, the addition of a little tender grass, cut fine, on the second day. In the course of a few days they will become strong enough to commence investigations of the near neighborhood, and may be transferred from the nest to a coop, slatted up so that the old goose will be confined while the openings between the slats will permit the goslings to pass in and out freely.

When the goslings appear to have gained sufficient strength for longer explorations, the mother may be given her liberty, when she will lead her flock all over the pastures, and may be trusted to care for them unassisted by her owner. Geese left at large in this way will thrive and grow fat simply on what they can pick up suited to their taste on almost any uncultivated meadow. Grass and various wild plants furnish their staple food from April until November, at which time their young are ready for market.

Geese should be fed like ducks, the animal and vegetable food predominating, with a small proportion of grain food during the middle of the day. Mashes of bran and corn meal, with cooked vegetables, should be fed morning and night. Grasses, green rye and green vegetables will be of advantage to the birds.

Plans for building a suitable house for geese is shown in the illustration; and when only a few ducks are kept, the same building will



HOUSE FOR WATER FOWL.

also do for geese. It is arranged in the interior like the house for ducks, previously described in this chapter. The roof is changed in this plan, but the plain simple shed roof may be substituted if desired.

The Gray-Lag Goose.

Our Common goose, the Embden, Toulouse and Sebastopol, are supposed to have descended from the Gray-Lag goose of northern Europe. The wild goose of America is the Canada goose, which has been domesticated to a limited extent, but has not become the parent of any distinct variety or family of geese. Another species of the wild bird represented in domestication, is the knobbed variety of Chinese geese. Other wild specimens are the Egyptian goose, the Beau-goose, Pink-footed goose of Britain, and the Snow-goose of North America.

The Common Goose. Mr. Darwin, in his variations of animals and plants, treats on the antiquity of geese at great length. He says that "The Common goose is one of the most anciently domesticated of fowls, as shown by the fact that it was mentioned as being in domestication by Homer, and that geese were kept in the Capitol of Rome, 388 B. C., as sacred to Juno; this sacredness implying great antiquity."

The male and female of the wild Gray-Lag goose are of a dusky hue, while the gander of the tame species is generally pure white, and the goose dusky on the wings.

The Toulouse Goose. The average weight of this variety of geese is twenty pounds each for gander and goose. In color of plumage they are a dull gray, without penciling; the underparts extending to the vent are dingy white in color; also the wing and tail quills have an edging of the same color; this marking, in a subdued shade extends over the edge of each feather above the thighs and on the back at the base of the neck. The head, back part of neck and wing quills are a dark, rich gray, and the breast a lighter shade. In shape, they are squarely built and compact in form; heads, large; necks, medium in length and carried upright; legs, short, the lower parts of the birds nearly touching the ground.

The Embden Goose. This beautiful bird is named from Embden, in Westphalia. Its plumage is a pure white; the bill is a dark flesh color and its legs and feet are of a dark orange; the eyes are of a bright blue. In carriage they are very tall and erect, with fine square bodies, which, in fat specimens, touch the ground. They grow very heavy. Ganders have been known to weigh as much as thirty pounds at three years; and a goose of the same age weighed twenty-six pounds. A good weight for a breeding bird is twenty pounds.

The eggs of the Embden geese are white in color, very large, and rough in shell, which is extremely thick.

The Sebastopol Goose. This variety somewhat resembles the Frizzled fowl; its peculiar plumage alone distinguishing it from the Common goose. They are pure white in color; their feathers have the appearance of growing the wrong way, and are very long and gracefully curved, being very thin near the quill. Mr. Wright, speaking of them, says: "While the feathers of the Frizzled birds have considerable strength, and are, as a rule, properly webbed, those of the Sebastopol geese are very weak, and partially destitute of adhesion in the barbules, thus resembling in a considerable degree those of a Silky fowl, and being, in fact, midway in character between the Silky and the Frizzled. There is, however, a special peculiarity in these feathers, in that the stems of the feathers are in many places themselves slit up into narrow filaments, which are furnished with barbules, and for the time resemble, therefore, the barbs rather than the stem. Further up, these barbs often unite again to form a proper stem, thus presenting a variation from the normal type of stem precisely opposite in character to that of the Sonnerat Jungle Fowl."

The African Goose. These geese have been known in this country for about twenty-five or thirty years, but have not become as popular as some of the other varieties. They are not as productive as the Embden or Toulouse; in weight they

equal the Embden, and average between forty and fifty pounds per pair. For crossing with the Common goose they give size, and the progeny are quiet and productive. In color they are gray, resembling the Toulouse, but it is distinguished by the black, horny knob at the base of the upper mandible.

The Chinese Goose. This variety is sometimes called the Knobbed goose, and Hong Kong goose, owing to the protuberance or knob at the base of the bill, like that of the African goose. In appearance it resembles the swan. In range it is known throughout China, the greater part of Asia and in portions of Africa. It is stated, on the best authority, that the common domestic goose of India is a hybrid between this goose and the Gray-Lag. In size it is between the common goose and the swan; pairs average about thirty pounds. They are very prolific, more so than any other variety of their family. They lay about thirty eggs before desiring to sit, and sometimes lay three or four litters in one season. Their eggs are about two-thirds the size of those of the Common goose. The color of their plumage is a grayish-brown on the back and upper parts, passing to white or whitish gray on the abdomen; fore part of the neck and breast a yellowish gray, and a very dark brown stripe running down the entire back of the neck from the head to the back. The white variety is pure white throughout.

The Spur-Winged Goose. This species is related to the semi-palmated goose, which is a large, striking-looking bird, glossy, greenish-black, with the shoulders, rump, breast and abdomen pure white, and its voice is said to be a loud whistle. The Spur-Winged goose, as its name indicates, is provided with a long spur; the legs are rather high, and placed well under the body. There are three or four species of the genus, one of which, from eastern Africa, with the high frontal knob, is illustrated on page 3.

Dr. G. Bennett, in a letter to Mr. Gould, says: "The simi-palmated goose I have seen domesticated in Sydney in a poultry yard, having been hatched by a common hen. This bird in anatomy and habits evidently approaches the cranes. Especially when you see it running about the yard, it resembles a crane more than a goose. The black and white plumage imparts to the bird a very handsome appearance as it walks with a stately tread (not with the waddling gait of a goose) about the yard of my house, like one of the waders. They are easily tamed, and are very amicable to other poultry, but require company in order to thrive. The flesh, however, is coarse and not well-flavored. It inhabits southern, southeastern and northern Australia, but seems to have been driven away from the southern parts by the progress of cultivation. In Dr. Lichardt's time they were numerous and the flocks so dense in the north that the natives were enabled to procure numbers of them by spearing them when flying."

The knobless variety, which inhabits the western and southern portions, Mr. F. Ayres says, "is rated as the commonest of wild geese. The flesh of this species is by no means good eating, as the flesh is coarse and tasteless, and the young birds have scarcely any meat on them. Sometimes they are very shy and at others absurdly tame; as a rule, it requires heavy shot to kill them. They come out early in the morning from the swamps and reeds to feed on the grass seeds, and are often seen on the farmer's corn lands. If stalked in the long grass, they will

invariably creep away, instead of taking to wing, as they run at a good pace ; and by the time the hunter is on the spot expecting them to rise, he sometimes sees the head of one a couple of hundred yards off examining the situation. If the hunter squats when the birds are flying, they will often come and have a look at him, and this curiosity costs many their lives. As a rule, they are gregarious, but are sometimes seen singly, and at others in pairs ; they breed away from the water in thick, grassy or rushy spots, and lay a number of white eggs, with thick, glossy shells.

The Egyptian Goose. This is a beautiful bird, and is, no doubt, the most ornamental of all the geese. The head is black and gray, with a chestnut colored patch around the eyes ; the neck and back are gray and black ; the breast is chestnut in center and the remainder gray ; the body is gray and black on the upper parts, and pale buff or yellow, penciled with black lines, on the under parts ; the wings are white, horny spurs, about five-eights of an inch long ; the shoulders are white with a narrow black stripe or bar of rich metallic lustre ; the primaries and secondaries are glossy black , tail, glossy black ; thighs, pale buff in color ; shanks and toes, reddish yellow. They breed well in confinement, but are very quarrelsome ; the gander will fight other males of his species to the death, and is a persecutor of other inmates of the pond. It is to be hoped that domestication will modify this vicious disposition to some degree.

The Canada Goose. This variety is the wild goose of America. As an ornamental water-fowl, it has been kept in many places, but there is no reason why it should not be regarded as part of the regular stock of the farm yard. It is stated on good authority that after a little breeding in confinement, they produce much more delicate flesh than either of the common breeds. The head, bill and greater part of the neck are black, with a white stripe at the throat. The upper parts of the body are a brownish gray, with light edges. The dark plumage of the upper parts of body shades off to nearly white on the belly ; eyes, gray-brown ; the legs and feet blackish gray, or almost black.

THE SWAN.

The swan is a true ornamental fowl. It is a familiar sight on all lakes of the city parks, and is perhaps more universally known than any other of its kind. Its beauty is fascinating, and contrasted with the soft tones of the water, and outlined by the green foliage creates a picture well worth the master's hand.

The long, well-curved neck and an abundant plumage are peculiar characteristics of the swan alone. Their graceful outlines and affectionate regard for each other endear them to the hearts of all.

The swans, says Wright's Book of Poultry, like the geese and ducks, have a very wide range, being found in all but actually equatorial regions. Two species at least are common to both Europe and America, besides others more local in their character ; but Australia, as might have been expected from its isolated position, has a well marked species of its own. Every race is naturally migratory in its habits, though many

individuals will remain, especially in the more temperate regions, in the same localities throughout the year, only taking short flights to and fro. Their powers of flight are considerable when once fairly in air, but the rising appears to be difficult and awkward. They almost always, if not invariably, rise from water, striking down with both wings and feet, and thus proceed, half flying and half splashing, for some 20 to 30 yards before they fairly raise themselves ; after which, however, they frequently attain a great height, Franklin stating that he had seen them in the polar regions several thousand feet above the earth. They also descend into the water approaching it in a slanting direction, and stretching out their broad webbed feet to check their speed at the moment they enter the familiar element.

Swans generally pair for life, their whole behavior offering a beautiful example of conjugal fidelity. The two birds show the greatest affection for each other, always swimming in company, and caressing each other with their bills and necks in the most interesting manner, though the male is of course the more powerful and courageous. Both birds help to prepare the nest, the male chiefly gathering the materials, while the female seems to take the chief part in the actual construction. The nest is an enormous affair, being built up of a large mass of coarse water plants as a foundation, which is lined with finer grasses. In this six to nine eggs are generally laid, which are, of course, very thick in shell, and generally of a dirty white color, sometimes pale green. The time of incubation has been differently stated, but we believe Bechstein to be right in fixing it at 35 days, though some say 42. The young when hatched are very thickly covered with down, and are generally taken to the water by the mother when only a day or two old. There they are watched over by both parents with the greatest care until grown enough to take care of themselves.

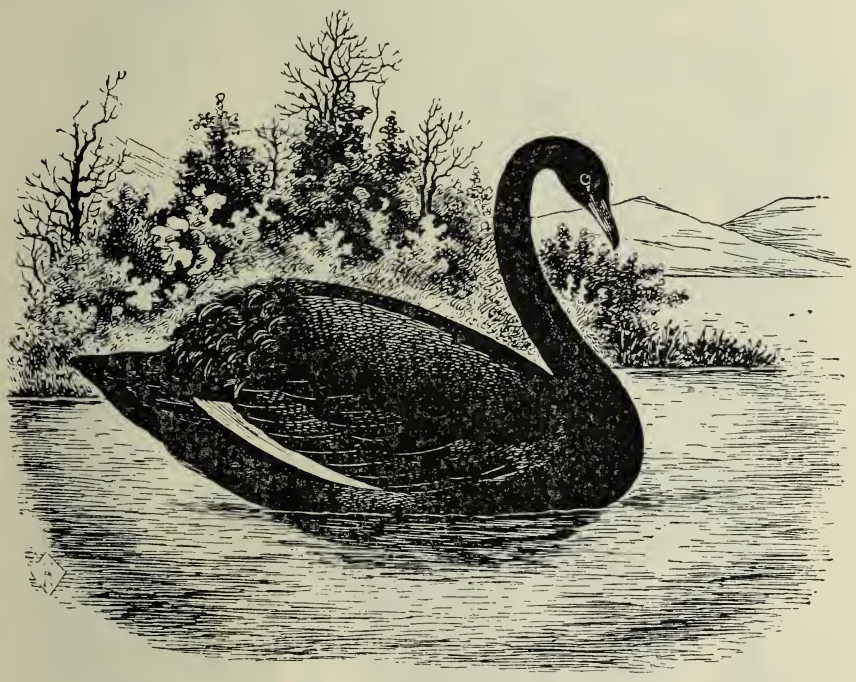
About the care of swans very little can be said. During the process of incubation any attempt at management is impossible and dangerous. During this period the birds are so intolerant of interference that even the appearance of man irritates them. All that can be done is to give the birds a little grain, and see that their privacy is not disturbed. Domestication would remedy this and make the birds more amenable to reason, and would increase the number of eggs. Considering the size of the birds, and the hardiness of the young, and their excellent quality, it is much to be wished that some serious attempt might be made to breed them more extensively for market purposes. When hatched, if very wild the cygnets can be fed by throwing coarse oatmeal or grit upon the water, or soaked biscuits may be given in the same manner ; but if the old birds are tame and familiar, they will often bring the brood to feed from the trough placed at the edge of the water, in which the feed should be placed, always in water, as in feeding grain to ducks.

The five most common breeds are the Mute swan, the Whistling swan, the Black swan, the Blacknecked swan and the Bewick's swan. The Mute swan is that so well known upon our lakes and water courses as an ornamental bird, and is a native of Northern Asia and Europe. It is the largest and most beautiful of all the swans, the neck being very long and slender. The bill is red and the large protuberance at the base black ; the eye brown and the legs and feet brownish or blackish gray ; and the plumage all over a pure and spotless white; its voice is soft and

low, with a pleasing, melancholy tone. It is not mute as its name implies. The cygnets when hatched, and for a good while after, are gray.

The Whistling swan would more appropriately be called the musical swan. The bill on this species wants the protuberance of the Mute swan, and is yellow; it is also somewhat smaller, and the neck is considerably shorter and thicker than the Mute swan. Its beautiful voice is enough alone to make its thorough domestication worth a little trouble.

After the Mute swan the Black is the best known, having been imported from Australia many years back. The eyes are scarlet, the legs black, the bill red, tipped with white; the plumage is rather sooty black, shading on the edges of many of the feathers into a very dark gray. In the long and slender neck, and general outline, it resembles the Mute swan, but is not quite so large. The Black swan breeds freely and the young are hardy. They are established favorites on our ornamental waters and in the Zoological gardens.



THE BLACK SWAN.

The Blacknecked swan is sometimes called the Chilean swan. It is a most beautiful bird and is imported from South America. Its eyes are brown, the bill lead color, with the protuberance (which is strongly marked in this species) red; the legs are reddish-orange. The plumage is pure white, except the head and neck, which are jet black, excepting a narrow streak of white across the eye. In swimming the neck is held nearly straight, like that of the goose, not curved as in most other swans. The young are said to grow with immense rapidity, which is worthy of note with a view to domestication.

Bewick's swan is a still smaller white bird. The neck is very slender, but not long. It is very shy and timid in captivity, and we believe has never been bred in such circumstances; it is indeed very difficult to obtain any of the rarer swans in pairs, the specimens captured being generally odd birds which have been wounded.



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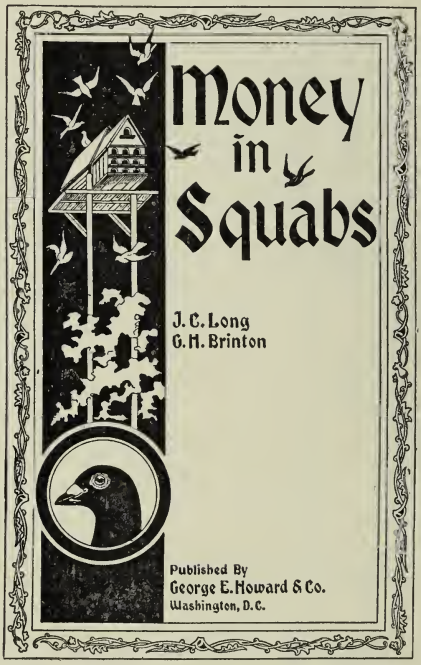
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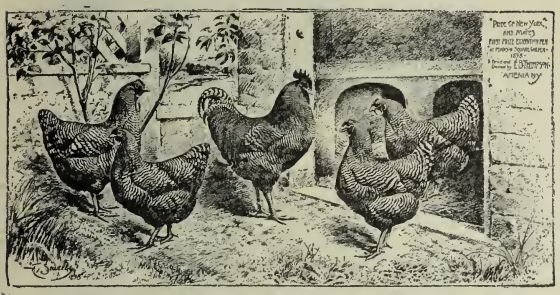
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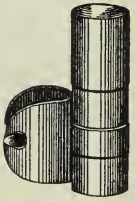
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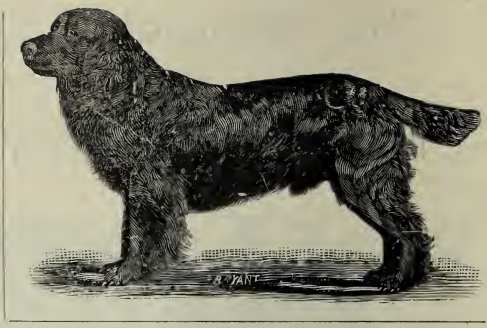
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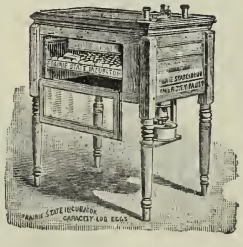
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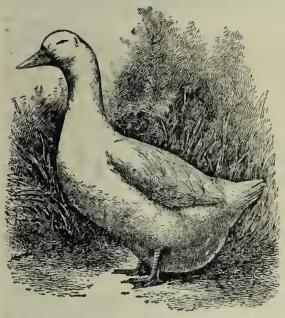
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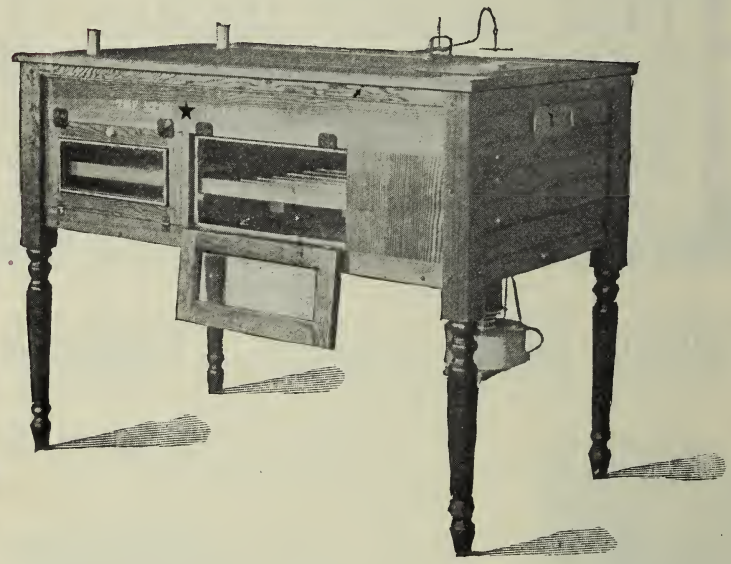
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